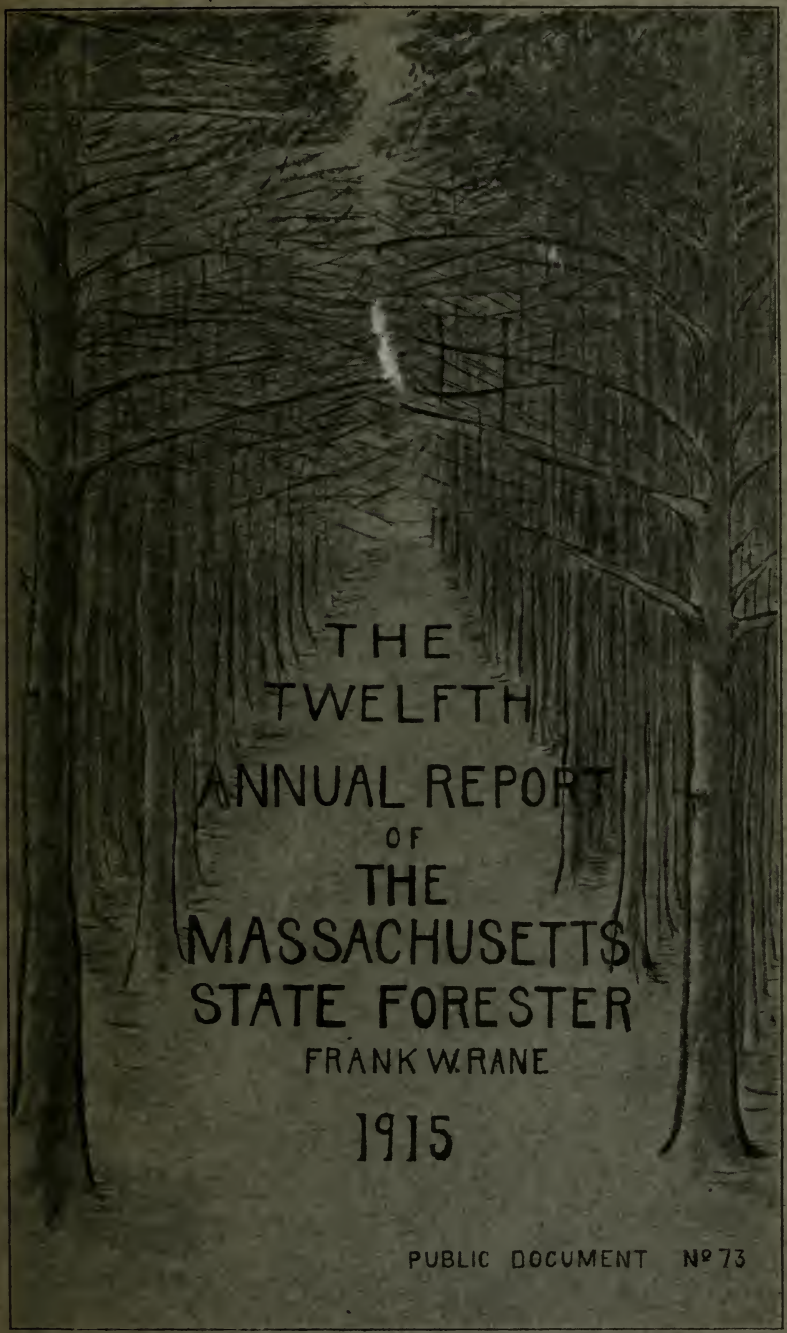

THE TWELFTH ANNUAL REPORT OF THE MASSACHUSETTS STATE FORESTER

FRANK W. RANE

1915

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THE STATE FORESTER OF MASSACHUSETTS.

TWELFTH ANNUAL REPORT,

1915.

F. W. RANE, State Forester.

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Approved by
The State Board of Publication.

The Commonwealth of Massachusetts.

To the General Court.

In accordance with the provisions of chapter 409, section 5, Acts of 1904, it becomes my duty and pleasure to submit this, the annual report of the State Forester, for the past year.

The usual hearty co-operation on the part of our citizens, as well as that of the General Court, has made the year's work very pleasant and agreeable to perform.

Respectfully submitted,

F. W. RANE,
State Forester.

Dec. 20, 1915.

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Forest utilization. Buck's chair factory, West Sterling, Mass. This photograph shows what can be used in making chairs. The utilization of the poorer classes of forest products gives opportunity for better management of the woodlands.

The Commonwealth of Massachusetts.

TWELFTH ANNUAL REPORT OF THE STATE FORESTER.

Introduction.

The State Forester and his assistants have been extremely busy throughout the past season, not only in continuing the work reported upon in past years, but in embarking upon many new forestry enterprises. Our work has been very satisfactory in achieving definite results, and there has been real co-operation on the part of our citizens, which augurs well for future good.

Forestry work in the past has been looked upon by our people as dealing too much in futures, and we Americans have not been interested in long-time investments, but now that forest fires, insects and diseases are being combated and controlled more and more, forestry enterprises are being considered more favorably. They may be advantageously compared with life insurance policies. When land is purchased, planted and registered in accordance with the Massachusetts forest taxation law, the added growth each year becomes a commercially recognized dividend upon the investment.

If for any reason a person finds it burdensome to continue paying his insurance premiums he does not lose the investment already made, and he is even allowed to borrow on it as collateral. It is just so with a white-pine plantation. It will be unnecessary to wait until the trees are large enough to be cut into lumber, — the owner can find a ready market for well-stocked plantations at any stage of their growth. When reforestation is looked at in this light the long-time investment idea is overcome.

The satisfactory working of our reforestation law is proved by the fact that each year finds more lands in readiness to be turned over to us than we can accept. When the large tracts now under consideration are once acquired by the Commonwealth for State forests, a fair portion of which is adapted for immediate planting, the fund available under this law will naturally be used for reforestation on these lands.

The departmental activities during the year have been real forestry undertakings. In scanning this report the reader will find that practical operations and definite results have been the aim constantly in view. The organization of the work throughout the year has been more thorough and comprehensive. As the policy of a new and growing department becomes more stable, it is inevitable that each person assume more responsibility. Undoubtedly other plans for the readjusting of the department, thereby increasing its usefulness, which have for some little time been in the mind of the State Forester, would have been carried into effect but for the fact that the Commission on Economy and Efficiency has had a deputy in the department for the past year, making a study of its activities and methods. It was thought best to await this report, thus avoiding complications.

In addition to such lines of endeavor as forest thinning and management, forest fire work, reforestation and nursery work, inspection of locomotives, insect and disease work, there have been innumerable demands upon us for lectures, examinations, publications, meetings, exhibitions and experimental forestry work. We were also called upon to direct the expenditure of $100,000 for work in aid of the unemployed during the winter and early spring. Large tracts of moth-infested woodlands have been operated by cutting, milling and selling the forest products, the expense of which was wholly met by the owners. We have also assisted the State Forest Commission in searching out large tracts of waste lands in various sections of the State, making surveys, looking up owners, titles, etc.

The slash law, which went into effect on Jan. 1, 1915, compelling all operators of woodlots to remove or burn the brush or slash for a distance of 40 feet from the railroad, highway or abutting woodland, has proved a step in the right direction,

and will undoubtedly be of great future value in providing fire lines.

The moth work of the year has been strenuous and effective. Our appropriation was lessened by $25,000 as compared with the previous year. The fact that $100,000 was turned over to the department for winter work for the unemployed doubtless accounted for this curtailment. While the work done by the unemployed was far more efficient than would have been thought possible, it was carried on at a season of the year when only certain kinds of work could be done. Work of a permanent nature was accomplished; hence our general conditions have been improved. On the other hand, our regular routine work of moth suppression, such as spraying, which could not be done until later in the season, suffered by this curtailment, and we found that careful planning was required to do the necessary summer work.

The United States government, through the Bureau of Entomology, continues to be responsible for preventing the spread of the gypsy moth, and has its picket line encircling the infested belt. Thus far the government men have been able to intrench themselves against the moth invasion, and it is certainly to be hoped that the insect can be held at bay, for once the government acknowledges defeat so much more territory will fall back upon the State to be handled. This department has continued to give the government assistance by doing more co-operative work in the border towns, thus helping to hold back the spread in those towns.

Our organization, equipment and methods of combating the moths throughout the infested areas have been far more effective than ever before. The Cape country is the section hardest hit at present. Instead of its being a scattered infestation, as it was a few years back, it has become general. This was inevitable, and it now devolves upon this section to cope with the problem by taking advantage of the experience gained in those sections earlier infested.

It is absolutely necessary for the State to adhere to its present well-defined policies for moth suppression. Although the task is a mammoth one, nevertheless there can be no question but that results are being obtained, and if the policy of secur-

ing efficient supervision and modern equipment in the towns and cities is encouraged, we believe it is only a matter of time when the destructive pests will be under control.

The work of the parasites and diseases is as encouraging as ever; we refer to Dr. Howard's report elsewhere in this publication for details regarding parasites.

That the economic forestry methods, combined with rational spraying and creosoting, are the practical solution of moth control is generally accepted at the present time. Our wide-awake division superintendents are enthusiastic over the results, and have taken so naturally to the handling of woodlands for moth control that some of them are qualifying as expert forest operators.

Forestry in general needs continued encouragement, and we feel that the General Court can ill afford to do aught else than to give it support through generous financial assistance until much of our waste lands are planted and our inferior woodlands are restocked and properly managed for definite results. This work is bound to cost the State something, but any far-sighted statesman or economist can see the wisdom of such a policy.

One of the difficult and perplexing problems that forestry work has met in eastern Massachusetts has been our inability to secure competent woodchoppers. With the present-day tendency of our towns and cities to pay all laborers the same wage per day, and with the hours of work reduced to an eight-hour day, it is no wonder that cordwood has become an expensive commodity. Chopping has become a lost art, and the sooner we resort to the practice of paying laborers by the cord or thousand feet, in order to obtain economic results, the better. Certainly a man who cuts one-half a cord a day is not worth as much as another who can put up two cords. It has been necessary, therefore, in a number of instances, to import labor into the town in order to make the work an economic success. This practice, however, is resulting in improving local standards and putting a premium upon the employment of men upon their real merits.

The State Forester has had reason to be proud of his organization the past year, for besides the regular work, the expenditure of $100,000 in labor among the unemployed

during the winter and early spring were all supervised, with the bookkeeping this involved, in our office. This work was accomplished at no extra expense of supervision to the State, and hence the funds all went directly for the purpose intended, — the really worthy unemployed.

Many other activities are touched upon in this report than those mentioned in this introductory statement. It is hoped that the reader will catch some of the true inspiration of our work.

Organization.

There have been very few changes in the personnel of the staff during the year.

We sustained a great loss in the sudden death of Mr. John Murdoch, Jr., A.M., one of the forestry assistants who had been connected with the department since 1911. He met his death last winter while superintending the removal of one of our portable camps at Randolph. He was a graduate of the Harvard Forestry School, and had spent several years in the west in the employ of the United States Forest Service. He was a man of keen intellect, and had become closely identified with our work. His untimely death was greatly deplored by all his colleagues, and it being the first accident befalling our staff it has had the effect of making the bond of fellowship among us closer than ever.

Mr. Guy W. Lucas, B.Sc., who was employed in the moth department work, was promoted to the position left vacant through the death of Mr. Murdoch.

Mr. Leroy F. Richardson, M.F., was connected with the department for a few months, but resigned to take work elsewhere.

The organization is at present as follows: —

General Staff.

F. W. Rane, B.Agr., M.Sc.,	State Forester.
C. O. Bailey,	Secretary.
Elizabeth Hubbard,	Bookkeeper.
Elizabeth T. Harraghy,	Stenographer.
Jennie D. Kenyon,	Stenographer.
Mabel R. Hamnett,	Clerk.
James H. Crowley,	Office boy.

General Forestry.

F. W. Rane, B.Agr., M.Sc.,	State Forester.
H. O. Cook, M.F.,	Assistant forester in charge.
F. L. Haynes, B.F.,	Forest examiner.

J. R. Simmons, B.Sc.,	Reforestation work.
Harold Fay, M.F.,	Assistant forester.
Eben Smith,	Superintendent, Barnstable Nursery.
Dean Townsley,	Superintendent, Amherst Nursery.
J. L. Peabody,	Field foreman.
James Morris,	Field foreman.
H. N. Butler,	Field foreman.
H. H. Chase,	Field foreman.

Staff, Moth Work.

F. W. Rane, B.Agr., M.Sc.,	State Forester.
Geo. A. Smith,	Assistant (equipment, accounts, etc.).
Paul D. Kneeland, M.F.,	Assistant (woodlands, products, etc.).
Ray F. Weston, M.F.,	Assistant.
Guy W. Lucas, B.Sc.,	Assistant.
Francis V. Learoyd,	Supplies.

District Moth Men.

1. John W. Enwright, Medford.
2. Saul Phillips, Beverly.
3. John J. Fitzgerald, Haverhill.
4. Wm. A. Hatch, Marlborough.
5. Harry B. Ramsey, Worcester.
6. C. W. Parkhurst, Foxborough.
7. W. F. Holmes, East Braintree.
8. J. A. Farley, Plymouth.

Staff, Forest Fire Prevention.

F. W. Rane, B.Agr., M.Sc.,	State Forester.
M. C. Hutchins,	State Fire Warden.
Josepha L. Gallagher,	Secretary.
James E. Moloy,	Locomotive inspector.
Miner E. Fenn,	Locomotive inspector.

District Forest Wardens.

1. Oscar L. Noyes, Byfield.
2. Jos. J. Shepherd, Pembroke.
3. John P. Crowe, Westborough.
4. Albert R. Ordway, Westfield.

Observers.

District 1.

E. Gordon Bailey, Georgetown.
John Chaplin, Sharon.
J. Frank Hammond, Chelmsford.
Caplis McCormick, Essex.
John H. O'Donnell, Wakefield.
Frederick R. Stone, Sudbury.

District 2.

Calvin Benson, Barnstable.
M. J. Zilch, Rehoboth.
Frank L. Buckingham, Plymouth.
John H. Montle, Fall River.
S. Matthews, Middleborough.
Calvin C. Parker, Harwich.
W. F. Raymond, Bournedale.
Chas. F. Kimball, Hanson.
W. I. Moody, Falmouth.

District 3.

A. M. Bennett, Pelham.
Michael E. Lyons, Westborough.
F. H. Lombard, Warwick.
George W. Sherman, Brimfield.
James Maley, Princeton.

District 4.

Edward J. McIntire, Becket.
N. C. Woodward, Shelburne Falls.
George C. Miller, Holyoke.
H. H. Fitzroy, Savoy.
C. B. Knowlton, Ashfield.
George Clifford, Williamstown.
Robert Miller, Lenox.
Clayton Bunt, Mount Washington.

List of Forest Wardens and Local Moth Superintendents.

[Alphabetically by towns and cities.]

Telephone Number.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
236, Rockland,	A. B. Reed,	Abington,	C. F. Shaw,	7
10-4,	Wm. H. Kingsley,	Acton,	J. O'Neil,	4
2003-M,	H. F. Taber,	Acushnet,	A. P. R. Gilmore,	8
2-0, Kippers,	John Clancy,	Adams,	John Clancy,	5
1431-M,	E. M. Hitchcock,	Agawam,	– –	–
161-6,	Wm. F. Milligan,	Alford,	– –	–
274-M,	Jas. E. Feltham,	Amesbury,	A. L. Stover,	3
541-M,	A. F. Bardwell,	Amherst,	W. H. Smith,	5
212,	W. I. Morse,	Andover,	J. H. Playdon,	3
35,	W. H. Pierce,	Arlington,	Daniel M. Daley,	1
2-12,	J. T. Withington,	Ashburnham,	Chas. H. Pratt,	4
8014,	Wm. S. Green,	Ashby,	Fred C. Allen,	4
3-5,	Ralph Fredick,	Ashfield,	– –	–
479-W,	Horace Piper,	Ashland,	Theodore P. Hall,	6
6 or 48-J,	Frank P. Hall,	Athol,	W. S. Penniman,	5
34-4,	H. R. Packard,	Attleboro,	W. E. S. Smith,	6
5-12,	J. F. Searle,	Auburn,	J. F. Searle,	5
3259-M,	J. W. McCarty,	Avon,	W. W. Beals,	7
– –	– –	Ayer,	D. C. Smith,	4
– –	H. C. Bacon,	Barnstable,	Robt. Cross,	8
83-4,	A. E. Traver,	Barre,	G. R. Simonds,	5
18,	P. B. McCormick,	Becket,	– –	–
– –	John I. Blake,	Bedford,	W. A. Cutler,	1
10-2,	Jas. A. Peeso,	Belchertown,	E. C. Howard,	5
8639-2, Milford,	L. F. Thayer,	Bellingham,	H. A. Whitney,	6
409-W,	John F. Leonard,	Belmont,	C. H. Houlahan,	1
14-6,	G. H. Babbitt,	Berkley,	A. A. Briggs,	6
1367-M,	Walter Cole,	Berlin,	E. C. Ross,	4
2-13,	Edson W. Hale,	Bernardston,	Edwin B. Hale,	5
319-J,	Robt. Grant,	Beverly,	J. B. Brown,	2
22-2,	E. N. Bartlett,	Billerica,	John W. Bostwick,	1
875-L-1, Woonsocket.	Thomas Reilly,	Blackstone,	A. J. Gibbons,	5
12-2,	I. E. Whitney,	Blandford,	– –	–
9-14,	E. E. Hurlburt,	Bolton,	C. E. Mace,	4
– –	– –	Boston,	Park and Recreation Department.	1

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS — *Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
103-13,	Emory A. Ellis,	Bourne,	Edward D. Nickerson.	8
11-2, West Acton,	H. J. Livermore,	Boxborough,	C. E. Sherry,	4
42-21,	Harry L. Cole,	Boxford,	C. Perley,	3
4-4,	John N. Flagg,	Boylston,	R. B. Smith,	5
433-R,	J. M. Cutting,	Braintree,	Clarence R. Bestick.	7
- -	T. B. Tubman,	Brewster,	David L. Harwood,	8
281-3,	F. C. Worthen,	Bridgewater,	F. C. Worthen,	7
18-2,	Geo. E. Hitchcock,	Brimfield,	C. W. King,	5
1041,	Harry L. Marston,	Brockton,	George C. Kane,	7
104-13,	P. E. Gadaire,	Brookfield,	J. H. Conant,	5
376,	Geo. H. Johnson,	Brookline,	Ernest B. Dane,	1
52-8,	Gilbert E. Griswold,	Buckland,	- -	-
15-4,	Walter W. Skelton,	Burlington,	W. W. Skelton,	1
47-M,	F. C. Estes,	Canton,	A. Hemenway,	7
- -	- -	Cambridge,	J. F. Donnelly,	1
76-M, Concord,	G. G. Wilkins,	Carlisle,	G. G. Wilkins,	1
16-2,	H. F. Atwood,	Carver,	H. F. Atwood,	8
14-12,	A. L. Veber,	Charlemont,	- -	-
42-2,	Edward A. Lamb,	Charlton,	J. D. Fellows,	5
28-3,	Geo. W. Ryder,	Chatham,	Chas. R. Nickerson.	8
1597-R, Lowell,	A. C. Perham,	Chelmsford,	M. A. Bean,	1
- -	- -	Chelsea,	J. A. O'Brien,	1
236-W,	George Korn,	Cheshire,	- -	-
7-4,	Wm. E. Major,	Chester,	- -	-
4,	Chas. A. Bisbee,	Chesterfield,	- -	-
149-M,	John E. Pomphret,	Chicopee,	John F. Sullivan,	5
- -	Robt. W. Vincent,	Chilmark,	A. S. Tilton,	8
352-24,	D. W. Blanchard,	Clarksburg,	Chas. E. Wemple,	5
312-W,	A. J. Robinson,	Clinton,	John B. Connery,	4
260,	Wm. J. Brennock,	Cohasset,	George Young,	7
23-2,	Frank A. Walden,	Colrain,	Edgar F. Copeland,	5
75-W,	Frank W. Holden,	Concord,	H. P. Richardson,	4
15-2,	Edgar Jones,	Conway,	- -	-
8001,	Thos. A. Gabb,	Cummington,	- -	-
42-12,	S. L. Ceasar,	Dalton,	- -	-
- -	Thos. L. Thayer,	Dana,	T. L. Thayer,	5
295-W,	M. H. Barry,	Danvers,	T. E. Tinsley,	2

List of Forest Wardens and Local Moth Superintendents — *Con.*

Telephone Number.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
14-3, Westport,	E. W. Reed,	Dartmouth,	E. M. Munson,	8
373,	H. J. Harrigan,	Dedham,	J. T. Kennedy,	7
273-14, Greenfield,	Wm. L. Harris,	Deerfield,	Wm. L. Harris,	5
– –	Chas. E. Pierce,	Dennis,	H. H. Sears,	8
29-3,	Ralph Earle,	Dighton,	F. C. Lane,	6
11-4,	Wm. L. Church,	Douglas,	F. J. Libby,	5
373-3,	John Breagy,	Dover,	H. L. MacKenzie,	6
3353-2,	Frank H. Gunther,	Dracut,	T. F. Carrick,	1
152-2, Webster,	Frank A. Putnam,	Dudley,	Herbert J. Hill,	5
5-11, Tyngsborough.	Archie W. Swallow,	Dunstable,	W. H. Savill,	4
4-2,	Henry A. Fish,	Duxbury,	H. A. Fish,	7
46-5,	R. H. Copeland,	E. Bridgewater,	Frank H. Taylor,	7
– –	– –	E. Longmeadow,	– –	–
24-3,	A. L. Gill,	Eastham,	N. P. Clark,	8
2-11,	J. M. Dineen,	Easthampton,	– –	–
76,	Frederick Hanlon,	Easton,	R. W. Melendy,	6
241-2,	Manuel Swartz,	Edgartown,	John P. Fuller,	8
165-25,	Frank Bradford,	Egremont,	– –	–
17-11,	H. A. Coolbeth,	Enfield,	H. C. Moore,	5
– –	C. H. Holmes,	Erving,	Charles H. Holmes,	5
– –	Otis O. Story,	Essex,	O. O. Story,	2
– –	– –	Everett,	P. O. Sefton,	1
1686-Y,	Chas. F. Benson,	Fairhaven,	G. W. King,	8
822-W,	Wm. Stevenson,	Fall River,	Wm. Stevenson,	6
136-2,	H. H. Lawrence,	Falmouth,	W. B. Bosworth,	8
745,	P. S. Bunker,	Fitchburg,	Page S. Bunker,	4
9417-3, Hoosac Tunnel.	H. B. Brown,	Florida,	– –	–
15-5,	E. A. White,	Foxborough,	F. W. Richardson,	6
352-4,	B. P. Winch,	Framingham,	N. I. Bowditch,	6
66-12,	Edw. S. Cook,	Franklin,	J. W. Stobbart,	6
3-12,	Andrew Hathaway,	Freetown,	G. M. Nichols,	6
191-M,	G. S. Hodgman,	Gardner,	T. W. Danforth,	5
– –	Leander B. Smalley,	Gay Head,	J. W. Belain,	8
– –	Thos. A. Watson,	Georgetown,	C. J. Eaton,[1]	3
– –	Lewis C. Munn,	Gill,	Henry D. Clark,	5
448-W,	Herbert J. Worth,	Gloucester,	H. J. Worth,	2
18-4,	John S. Mollison,	Goshen,	– –	–

[1] Deceased.

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS — *Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
– –	R. E. Bennett,	Gosnold,	– –	–
– –	Elmer E. Sibley,	Grafton,	C. K. Despeau,	5
6-4,	G. L. Murray,	Granby,	Chas. N. Rust,	5
12-11,	Harry A. Root,	Granville,	– –	–
327-W,	D. W. Flynn,	Great Barrington.	T. J. Kearin,	5
439-M,	J. W. Bragg,	Greenfield,	J. W. Bragg,	5
33-24, Enfield,	Wm. H. Walker,	Greenwich,	E. A. Sawtelle,	5
71-5,	Chas. M. Raddin,	Groton,	J. F. Bateman,	4
2939-M,	Sidney E. Johnson,	Groveland,	R. B. Larive,	3
651-33,	Edw. P. West,	Hadley,	Edw. P. West,	5
5-32, Bryantville,	Geo. A. Estes,	Halifax,	F. D. Lyon,	7
128-M,	Fred Berry,	Hamilton,	E. G. Brewer,	2
5-14,	Edw. P. Lyons,	Hampden,	– –	–
17-F-2,	Chas. F. Tucker,	Hancock,	– –	–
51-5, Rockland,	Chas. E. Damon,	Hanover,	L. Russell,	7
12-23, Bryantville,	Geo. T. Moore,	Hanson,	Geo. T. Moore,	7
2-5,	Henry J. Breen,	Hardwick,	Geo. J. Fay,	5
46-3,	Benj. J. Priest,	Harvard,	G. C. Maynard,	4
102-12,	John Condon,	Harwich,	Arthur F. Cahoon,	8
72-4,	Fred T. Bardwell,	Hatfield,	Seth W. Kingsley,	5
4-2,	John B. Gordon,	Haverhill,	M. J. Fitzgerald,	3
6-7, Charlemont,	Herbert A. Holden,	Hawley,	– –	–
5-18,	S. G. Benson,	Heath,	– –	–
21305 or 500,	Geo. Cushing,	Hingham,	T. L. Murphy,	7
– –	A. N. Warren,	Hinsdale,	– –	–
134-W, Randolph,	Melvin L. Coulter,	Holbrook,	Bradford Parks,	7
42-4,	Winfred H. Stearns,	Holden,	W. H. Stearns,	5
5-21, Brimfield,	Oliver L. Howlett,	Holland,	A. F. Blodgett,	5
1-2,	W. A. Collins,	Holliston,	Herbert E. Jones,	6
2468-M,	C. J. Haley,	Holyoke,	T. A. Bray,	5
395-R,	W. F. Durgin,	Hopedale,	W. F. Durgin,	5
Central,	R. I. Frail,	Hopkinton,	W. A. MacMillan,	5
35-11,	W. L. Lovewell,	Hubbardston,	Otto Rugg,	5
– –	Wm. L. Wolcott,	Hudson,	F. P. Hosmer,	4
– –	– –	Hull,	J. Knowles,	7
4-11,	John J. Kirby,	Huntington,	– –	–
163-M,	Arthur H. Walton,	Ipswich,	J. A. Morey,	2

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS — *Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
15-3,	Arthur B. Holmes,	Kingston,	R. F. Randall,	8
261-W,	Nathan F. Washburn,	Lakeville,	N. F. Washburn,	7
218-J,	Arthur W. Blood,	Lancaster,	L. R. Griswold,	4
1295-24,	King D. Keeler,	Lanesborough,	Geo. H. Judivine,	5
90,	Dennis Carey,	Lawrence,	I. B. Kelly,	3
66-3,	Jas. W. Bossidy,	Lee,	– –	–
37-5,	B. H. Fogwell,	Leicester,	J. H. Woodhead,	5
135,	Oscar R. Hutchinson,	Lenox,	T. Francis Mackey,	5
546,	Fred A. Russell,	Leominster,	D. E. Bassett,	4
9-44, Cooleyville,	O. C. Marvell,	Leverett,	H. W. Field,	5
480,	Robert Watt,	Lexington,	A. P. Howe,	1
289-11, Greenfield,	Jacob Sauter,	Leyden,	Wm. A. Campbell,	5
44-W,	John J. Kelliher,	Lincoln,	J. J. Kelliher,	4
17-4,	A. E. Hopkins,	Littleton,	A. E. Hopkins,	4
6375-J,	Oscar C. Pomeroy,	Longmeadow,	– –	–
3400,	E. F. Saunders,	Lowell,	J. G. Gordon,	1
1-12,	H. A. Munsing,	Ludlow,	Ashley N. Bucher,	5
20,	J. S. Gilchrest,	Lunenburg,	James S. Gilchrest,	4
1174,	Geo. A. Cornet,	Lynn,	G. H. McPhetres,	2
17-2,	Oscar E. Phillips,	Lynnfield,	L. H. Twiss,	2
– –	Watson B. Gould,	Malden,	W. B. Gould,	1
319-W,	Peter A. Sheahan,	Manchester,	P. A. Sheahan,	2
281-W,	Herbert E. King,	Mansfield,	E. Jasper Fisher,	6
– –	John T. Adams,	Marblehead,	W. J. Stevens,	2
116,	Richard W. Clark,	Marion,	J. Allenach,	8
416 or 151-M,	Edw. C. Minehan,	Marlborough,	M. E. Lyons,	4
43-3,	W. G. Ford,	Marshfield,	P. R. Livermore,	7
31-2, Cotuit,	Darius Coombs,	Mashpee,	W. F. Hammond,	8
13-3,	Frank A. Tinkham,	Mattapoisett,	Webster Kinney,	8
115-4 or 138-3,	Geo. H. Gutteredge,	Maynard,	A. Coughlin,	4
106-4,	W. E. Kingsbury,	Medfield,	G. L. L. Allen,	6
53 or 138,	C. E. Bacon,	Medford,	W. J. Gannon,	1
61-2 or 61-3,	Phineas McNutt,	Medway,	F. Hager,	6
– –	– –	Melrose,	J. J. McCullough,	1
188-M,	F. M. Aldrich,	Mendon,	F. M. Aldrich,	5
21-3,	Edgar P. Sargent,	Merrimac,	C. R. Ford,	3
229 C. F. D.,	Wilbur M. Freeman,	Methuen,	A. H. Wagland,	3

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS — *Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
232-W or 232-M, .	W. H. Connor, . .	Middleborough,	Linam Chute, .	7
1, pay station, .	G. E. Cook, . . .	Middlefield, .	– –	–
63-23, . . .	Oscar H. Sheldon, . .	Middleton, . .	B. T. McGlauflin, .	2
65-3, . . .	Elbert M. Crockett, .	Milford, . .	P. F. Fitzgerald, .	5
30, . . .	Harry L. Snelling, . .	Millbury, . .	E. F. Roach, .	5
5-2, . . .	Chas. LaCroix, . .	Millis, . . .	Everett Caldwell, .	6
322, . . .	Nathaniel T. Kidder, .	Milton, . .	N. T. Kidder, .	7
7-22, Readsborough.	Huel S. Tower, . .	Monroe, . .	– –	–
12-22, . . .	O. E. Bradway, . .	Monson, . .	Robert S. Fay, .	5
713-22, Greenfield,	Frank B. Gillette, .	Montague, . .	F. H. Gillette, .	5
164-25, Great Barrington.	Jasper H. Bills, . .	Monterey, . .	– –	–
3-24, Russell, .	Andrew J. Hall, . .	Montgomery, .	– –	–
17-21, Copoke, N. Y.	Guy W. Patterson, . .	Mt. Washington,	– –	–
– –	– –	Nahant, . .	T. Roland, . .	2
16-5, . . .	Peter M. Hussey, . .	Nantucket, .	C. C. Macy, . .	8
244-M, . .	Bernard Darling, . .	Natick, . .	H. S. Hunnewell, .	6
195-1, . . .	H. Howard Upham, .	Needham, . .	E. E. Riley, . .	6
– –	Chas. L. Baker, . .	New Ashford, .	– –	–
2280, . . .	Edw. F. Dahill, . .	New Bedford, .	C. F. Lawton, .	8
6-4, Gilbertville, .	Frank A. Morse, . .	New Braintree, .	E. L. Havens, .	5
13-6, Sheffield, .	E. M. Stanton, . .	New Marlborough.	– –	–
10, Cooleyville, .	Sewell V. King, . .	New Salem, .	R. King, . .	5
173-5, . . .	W. P. Bailey, . . .	Newbury, . .	Percy Oliver, .	3
380, . . .	Chas. P. Kelley, . .	Newburyport, .	C. P. Kelley, .	3
30, South, . .	Walter B. Randlett, .	Newton, . .	W. W. Colton, .	1
41-5, Franklin, .	Jas. T. Buckley, . .	Norfolk, . .	James T. Buckley,	6
265 or 205-W, .	H. J. Montgomery, . .	North Adams, .	John Martin, .	5
1029-J, . .	Wm. L. Smith, . .	North Andover, .	Fred W. Phelan, .	3
317-2, . . .	Chas. F. Gehrung, . .	North Attleborough.	F. P. Toner, .	6
63-4, . . .	Oscar C. Hirbour, . .	North Brookfield,	S. D. Colburn, .	5
33-3 or 45, . .	Henry A. Upton, . .	North Reading, .	G. E. Eaton, .	1
165 or 619-W, .	F. E. Chase, . . .	Northampton, .	Christopher Clarke,[1]	5
12-7, . . .	Clarence E. Bailey, .	Northborough, .	Lewis H. Smith, .	5
71-5 or 13-3, .	W. E. Burnap, . .	Northbridge, .	A. F. Whitin, .	5
2-3, . . .	Fred W. Doane, . .	Northfield, . .	F. W. Doane, .	5
2911, . . .	Geo. H. Storer, . .	Norton, . .	G. H. Storer, .	6
27-3, . . .	John Whalon, . . .	Norwell, . .	J. H. Sparrell, .	7

[1] Deceased.

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS — *Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
- -	F. W. Talbot,	Norwood,	C. A. Bingham,	6
119-4,	F. W. Chase,	Oak Bluffs,	P. P. Hurley,	8
17-5,	Chas. H. Trowbridge,	Oakham,	C. H. Trowbridge,	5
232-12,	Wm. Walsh,	Orange,	F. M. Jennison,	5
33-2,	James Boland,	Orleans,	A. Smith,	8
15,	D. A. Witter,	Otis,	- -	-
9-5,	Olin D. Vickers,	Oxford,	C. G. Larned,	5
53-3 or 53-12,	James Summers,	Palmer,	C. H. Keith,	5
159-J, Cedar,	Fred L. Durgin,	Paxton,	F. L. Durgin,	5
182-Y,	Michael V. McCarthy,	Peabody,	J. J. Callahan,	2
144-3,	Edw. E. Adriance,	Pelham,	Marion E. Richardson.	5
7-23, Bryantville,	Jos. J. Shepherd,	Pembroke,	Wm. C. Jones,	7
54-3 or 12-5,	Geo. G. Tarbell,	Pepperell,	J. Tune,	4
Central,	Dwight T. Raymond,	Peru,	- -	-
13-2,	Geo. P. Marsh,	Petersham,	Daniel Broderick,	5
176-6, Athol,	W. H. Cowlbeck,	Phillipston,	W. H. Cowlbeck,	5
834 or 535-M,	Chas. L. Klein,	Pittsfield,	- -	-
33-22, Cumming-ton.	Albert F. Dyer,	Plainfield,	- -	-
283-J, North Attleborough.	R. P. Rhodes,	Plainville,	John W. White,	6
264,	Ira C. Ward,	Plymouth,	A. A. Raymond,	8
13-7,	David L. Bricknell,	Plympton,	D. L. Bricknell,	8
19-4, Cooleyville,	A. W. Doubleday,	Prescott,	C. M. Pierce,	5
13-4,	F. W. Bryant,	Princeton,	F. A. Skinner,	5
49-11,	J. H. Barnett,	Provincetown,	J. M. Burch,	8
1, Quincy,	Faxon T. Billings,	Quincy,	A. J. Stewart,	7
35-4,	Richard F. Forrest,	Randolph,	Charles Cole,	7
1284-R,	John V. Festing,	Raynham,	G. M. Leach,	6
518-W,	H. E. McIntire,	Reading,	H. M. Donegan,	1
11-12,	Benj. F. Monroe,	Rehoboth,	R. E. Anderson,	6
- -	- -	Revere,	G. P. Babson,	2
8-2,	Timothy B. Salmon,	Richmond,	- -	-
12-5, North Rochester.	Daniel E. Hartley,	Rochester,	John N. Morse,	8
55-X,	John H. Burke,	Rockland,	F. H. Shaw,	7
28-4,	John C. Martin,	Rockport,	F. A. Babcock,	2
21-6, Charlemont,	Merritt A. Peck,	Rowe,	- -	-
3-13,	Daniel O'Brien,	Rowley,	L. R. Bishop,	3
279-2, Athol,	Levins G. Forbes,	Royalston,	P. F. Richards,	5

LIST OF FOREST WARDENS AND LOCAL MOTH SUPERINTENDENTS — *Con.*

TELEPHONE NUMBER.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
11-3, . . .	S. S. Shurtleff, . .	Russell, . .	- -	-
13-3, . . .	Henry Converse, . .	Rutland, . .	H. E. Wheeler, .	5
- -	- -	Salem, . . .	Warren P. Hale, .	2
123-21, Newburyport.	Jas. H. Pike, . . .	Salisbury, . .	H. C. Rich, . .	3
202-12, Winsted, Conn.	Arthur L. Strickland, .	Sandisfield, .	- -	-
43-2, Sagamore, .	Jerome R. Holway, .	Sandwich, . .	B. F. Dennison, .	8
115, . . .	Chas. L. Davis, . .	Saugus, . .	T. E. Berrett, .	2
4-16, . . .	Clinton Tilton, . .	Savoy, . . .	- -	-
129-3, . . .	E. R. Seaverns, . .	Scituate, . .	Lester D. Hobson,	7
399-L-5, Pawtucket.	John L. Baker, . .	Seekonk, . .	C. W. Thompson, .	6
185-3, . . .	Warren C. Morse, . .	Sharon, . .	J. J. Geissler, .	6
26, . . .	Arthur H. Tuttle, . .	Sheffield, . .	- -	-
130-2, . . .	Chas. S. Dole, . .	Shelburne, . .	Charles S. Dale, .	5
11-M, . . .	Milo F. Campbell, . .	Sherborn, . .	J. P. Dowse, .	6
16-21, . . .	A. A. Adams, . . .	Shirley, . .	A. A. Adams, .	4
48, . . .	E. A. Logan, . . .	Shrewsbury, .	Robert C. Clapp,	5
2-14, Cooleyville,	Nathan J. Hunting, .	Shutesbury, .	E. Colfax Johnson,	5
2632-M, Fall River.	Wm. F. Griffiths, . .	Somerset, . .	C. Riley, . .	6
- -	- -	Somerville, . .	A. B. Pritchard, .	1
3164-W, . .	Louis H. Lamb, . .	South Hadley, .	C. R. Frye, . .	5
151-23, . .	C. S. Olds, . . .	Southampton, .	C. S. Olds, . .	5
13, Marlborough,	Harry Burnett, . .	Southborough, .	H. Burnett, .	5
11, . . .	Aimee Langevin, . .	Southbridge, .	A. Langevin, .	5
8-2, . . .	B. M. Hastings, . .	Southwick, .	- -	-
77-4, . . .	A. F. Howlett, . .	Spencer, . .	G. Ramer, . .	5
- -	Chas. S. Taylor, . .	Springfield, .	J. Alden Davis, .	5
5-12, . . .	J. T. Wilder, . . .	Sterling, . .	J. H. Kilburn, .	4
- -	Geo. Schneyer, . .	Stockbridge, .	Brown Caldwell, .	5
176-3, . . .	Albert J. Smith, . .	Stoneham, . .	G. M. Jefts, . .	1
121-3, . . .	Fred H. Pye, . . .	Stoughton, .	W. P. Kennedy, .	7
166-21, Maynard,	Wm. H. Parker, . .	Stow, . . .	H. W. Herrick, .	4
6-1, . . .	C. M. Clark, . . .	Sturbridge, .	C. M. Clark, .	5
5-4, . . .	S. W. Hall, . . .	Sudbury, . .	W. E. Baldwin, .	4
46, South Deerfield.	A. C. Warner, . . .	Sunderland, .	Richard Graves, .	5
58-32, Millbury, .	Ransom H. Richardson, .	Sutton, . .	R. H. Richardson,	5
1911-J, . .	Everett P. Mudge, . .	Swampscott, .	E. P. Mudge, .	2
468-W. . .	Thos. L. Mason, . .	Swansea, . .	A. E. Arnold, .	6

List of Forest Wardens and Local Moth Superintendents — *Con.*

Telephone Number.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
1-W or 320,	Fred A. Leonard,	Taunton,	L. W. Hodgkins,	6
30 or 26-5,	C. A. Fletcher,	Templeton,	J. B. Wheeler,	5
4249-J, Lowell,	Harris M. Briggs,	Tewksbury,	H. M. Briggs,	1
161-4 or 102-3,	Elmer C. Chadwick,	Tisbury,	H. W. McLellan,	8
269-14, Winsted,	C. L. Vining,	Tolland,	- -	-
8038,	Chas. W. Floyd,	Topsfield,	C. W. Floyd,	2
37-2 or 51-2,	F. J. Piper,	Townsend,	G. E. King,	4
- -	Walter F. Rich,	Truro,	J. H. Atwood,	8
1, Tyngsborough,	Otis L. Wright,	Tyngsborough,	C. J. Allgrove,	1
3-6,	Clifford R. Canon,	Tyringham,	- -	-
17-4 or 4-2,	Chas. H. Marshall,	Upton,	G. H. Evans,	5
51-5,	Lewis F. Rawson,	Uxbridge,	Willard Holbrook,	5
58 or 455-M,	W. E. Cade,	Wakefield,	W. W. Whittredge,	1
- -	W. W. Eager,	Wales,	M. C. Royce,	5
107-2,	Jas. J. Hennessey,	Walpole,	George Kingsbury,	6
6,	Geo. L. Johnson,	Waltham,	W. M. Ryan,	1
117-13,	Joseph Dupre,	Ware,	F. Zeissig,	5
45-23 and 8004-14,	Dalbert C. Keyes,	Wareham,	J. J. Walsh,	8
- -	Timothy M. Collins,	Warren,	A. A. Warriner,	5
73-3, Orange,	C. A. Williams,	Warwick,	Chas. E. Stone,	5
12-4,	Lester G. Heath,	Washington,	- -	-
116, Newton North.	John C. Ford,	Watertown,	J. C. Ford,	1
31-3,	Howard C. Haynes,	Wayland,	D. J. Graham,	4
101-R,	Ernest L. Wallis,	Webster,	C. Klebart,	5
9 or 359-M,	John P. Doyle,	Wellesley,	F. M. Abbott,	6
- -	John Holbrook,	Wellfleet,	E. S. Jacobs,	8
74-32, Orange,	Lewis B. Bowen,	Wendell,	G. E. Mills,	5
74, Hamilton,	J. D. Barnes,	Wenham,	J. E. Kavanaugh,	2
73-3,	Fred E. Clark,	W. Boylston,	R. K. Parker,	5
4137,	Warren P. Laughton,	W. Bridgewater,	O. Belmore,	7
114-3, North Brookfield.	John H. Webb,	W. Brookfield,	J. H. Webb,	5
5-2 and 5-6,	Louis H. Flook,	West Newbury,	Frank D. Bailey,	3
2067-W,	Dana S. Moore,	W. Springfield,	Geo. W. Hayden,	5
8016,	Benj. P. Bissell,	W. Stockbridge,	- -	-
92-3,	Wm. J. Rotch,	West Tisbury,	H. W. Athearn,	8
74-2,	Geo. E. Walker,	Westborough,	Geo. Hayden,	5
111-Y or 111-W,	T. H. Mahoney,	Westfield,	- -	-

List of Forest Wardens and Local Moth Superintendents — *Con.*

Telephone Number.	Forest Warden.	Town or City.	Local Moth Superintendent.	Div. No.
44-11, . . .	Harry L. Nesmith, . .	Westford, . .	H. L. Nesmith, .	1
148-14, . .	Clayton A. Bartlett, .	Westhampton, .	- -	-
1-3, . . .	Windsor F. Neal, . .	Westminster, .	G. A. Sargent, .	5
37, Waltham, or 1392-M.	Benj. R. Parker, . .	Weston, . .	E. P. Ripley, .	4
14-21, . . .	Frank Whalon, . .	Westport, . .	H. A. Sanford, .	8
123-M, Dedham,	Elmer E. Smith, . .	Westwood, . .	Martin Sorenson, .	6
154-W, . .	E. S. Wright, . . .	Weymouth, .	C. L. Merritt, .	7
39-14, South Deerfield.	J. H. Pease, . . .	Whately, . .	Rylan C. Howes, .	5
349-W, . .	Clarence A. Randall, .	Whitman, . .	C. A. Randall, .	7
1-4, . . .	Henry I. Edson, . .	Wilbraham, .	F. B. Metcalf, .	5
8011-2, . .	John L. Brown, . .	Williamsburg, .	- -	-
34-W, . . .	Wm. H. Davies, . .	Williamstown, .	Wm. Davies, .	5
28-2, . . .	Oliver McGrane, . .	Wilmington, .	O. McGrane, .	1
29 or 190, . .	Arlon D. Bailey, . .	Winchendon, .	G. W. Drury, .	5
123-2 or 39-W, .	David H. DeCourcy, .	Winchester, .	S. S. Symmes, .	1
201-12, . .	Amos S. Ferry, . .	Windsor, . .	- -	-
- -	- -	Winthrop, . .	M. F. Smith, Jr., .	2
110, . . .	Frank E. Tracy, . .	Woburn, . .	H. B. Mackay, .	1
3064-M, Park, .	Arthur V. Parker, . .	Worcester, . .	H. J. Neale, . .	5
10-22, . . .	Chas. A. Kilbourn, . .	Worthington, .	- -	-
23-5, . . .	Geo. H. E. Mayshaw, .	Wrentham, . .	W. Gilmore, . .	6
53-33, Barnstable,	Jos. W. Hamblin, . .	Yarmouth, . .	C. R. Bassett, .	8

Office Work.

Perhaps it would not be out of place to say a few words here about the work of our office as it touches the general public.

Much time and conscientious work are spent in giving advice to any one who seeks it in regard to forest planting, thinning, forest insects and tree diseases.

Hundreds of insects are brought to this office for identification during the year, and information concerning their habits given and remedial measures recommended. Town officials are always welcome, and consultations in regard to local problems, local superintendents and their work, forest wardens and other matters are readily granted. The explanation of the

various complicated laws under which we work — forest taxation law, reforestation, gypsy-moth suppression, forest fire prevention — is often necessary, and is courteously and fully made.

We receive throughout the year many hundreds of applications for work, and although our work does not enable us to employ directly many persons, we often place them in towns or cities, with contractors in private thinning jobs, or on the North Shore.

The adjusting of town accounts by the bookkeeper is an important part of our work, and the office is always glad of an opportunity to compare our accounts with those of town treasurers, selectmen or local superintendents.

We are always glad to recommend literature to those desiring information regarding forestry matters, or we send such publications as we have free of charge.

We send out many circular letters of information to our division superintendents, forest wardens and town officials. We look up all complaints of individuals in regard to work that is poorly done by town officials or contractors, and inspect work done by contractors, if desired.

State Forester's Travel.

The activities of the State Forester during the year are probably far greater than most people realize. Besides the regular routine of his office, which necessarily demands constant attention, the forester has to travel from one end of the State to the other many times during the year.

Travel by automobile is the most satisfactory way, as it enables one to visit even remote and comparatively inaccessible places that a few years ago would have been difficult to see. It has not been uncommon for the forester to travel from 100 to 200 miles a day with his division men, and meanwhile examine the work in progress in many towns and cities. Travel by automobile alone approximated 15,000 miles during the year.

But few trips have been outside the State this year. The principal one was to attend the meeting of the Association of Eastern Foresters, which was held at Mont Alto, Pa., at the Pennsylvania Forestry Academy. The State of Pennsylvania has over 1,000,000 acres set aside as State forests, and these

forests are superintended and managed by the graduates of their own forest academy. Each graduate is required to devote three years following his graduation to the State's employ, for which he is paid a definite amount.

Each of these State forests has its particular problem to solve, and a comparison of results due to local markets, shipping facilities, etc., proved interesting. Visits like this are educational, as they offer splendid comparisons of undertakings in forestry under radically different conditions. Practical operations and methods pursued were discussed by the various foresters present.

Last February the State Forester was invited to take part in the dedication of the new forestry building at the Ohio State University at Columbus, O., at which time he gave an address on the subject, "Evolution of American Forestry." This is published elsewhere in the report.

Trips to Keene, N. H., and Peterboro, N. H., where forestry was discussed before good-sized audiences, were made during the year.

Obituaries.

Governors Guild and Rollins.

The State Forester bespeaks the privilege of calling to the attention of those who are lovers of trees and forests the great loss to Massachusetts, and New England in general, by the hand of death during the present year, of two of our Ex-Governors who have been closely identified with forestry development. These men were Governor Curtis Guild of Massachusetts and Governor Frank W. Rollins of New Hampshire. Due to his connection with the New Hampshire College, the writer was closely identified with the latter when he was Governor of New Hampshire. He was appointed to his present position in 1906 by Governor Guild, through whose personal interest the Massachusetts work was so rapidly advanced.

Governor Guild was elected president of the American Forestry Association, which office he held for two terms. Governor Rollins was president of the Society for the Protection of New Hampshire Forests from its inception, I believe, until his death. He was also chairman of the forestry committee of the Boston Chamber of Commerce for a number of years.

Removing wild cherry trees along the highway, Marshfield. These trees are stripped annually by the tent caterpillars and should be replaced by some trees that are better adapted to roadside planting.

A country roadside in Hingham where the food of the gypsy and brown-tail moths has been cut out. The remaining trees being evergreen need no future treatment, and hence this thinning is a great saving to the town.

Both Governors were powerful factors in aiding in the enacting by Congress of the Weeks bill, which has enabled us to establish national reserves in the White Mountains and in the southern Appalachian Mountains.

Truly these men may properly be designated as the forestry and conservation Governors of their respective States of Massachusetts and New Hampshire.

The writer considers it was indeed a privilege and inspiration to have been associated with these men, who were not only lovers of forestry and nature but of their fellow men, and examples of the true statesmen of our beloved country.

Relief for the Unemployed.

The late winter months of 1914 found many thousands of Massachusetts citizens without employment, and as the season advanced conditions did not improve, and later grew worse. Responsibility for this unfortunate condition was ascribed to many causes that need not be discussed here. By the time the Legislature convened in January the situation had become so acute as to arouse to action many philanthropic citizens and societies, and Governor Walsh, in opening his inaugural address to the Legislature, referred to the gravity of the situation in these words: "Unemployment, with its inevitable concomitants of suffering and crime, has risen above the normal level. First of all, I earnestly ask your immediate action to solve, as far as a solution is within our power, the pressing problem of the unemployed." In response to this urgent appeal of His Excellency for remedial legislation the committee of agriculture promptly reported the following resolve, which was with the utmost expedition passed by both branches of the General Court, and was approved by the Governor on Feb. 9, 1915: —

Resolved, That the state forester be directed to provide employment for needy persons deemed by him to be worthy thereof, preference being given to residents of the commonwealth and to persons who have others dependent upon them for support. The moneys authorized to be spent under the provisions of this resolve shall be spent upon the improvement and protection of forests and in any other public work which may in the opinion of the state forester be proper. There shall be allowed and paid

out of the treasury of the commonwealth for this purpose the sum of twenty-five thousand dollars, together with any unexpended balances of the amounts appropriated to be used under the provisions of chapter seven hundred and fifty-nine of the acts of the year nineteen hundred and thirteen and chapter five hundred and ninety-six of the acts of the year nineteen hundred and fourteen. For the purpose of carrying out the provisions of this resolve, the state forester may appoint his duly accredited agents as special police officers to serve for such period as may be determined by him and subject to removal by him. Such officers shall serve without pay, except their regular compensation as agents or employees of the state forester, and shall receive no fees for services or return of criminal process. They shall have, throughout the commonwealth, the powers of constables and police officers to arrest and detain any person violating the law of the commonwealth, but they shall not have power to serve any process in civil cases. The civil service laws and the rules and regulations made thereunder shall not apply to this resolve or to any action taken hereunder.

It is believed that this is the first instance where a State has endeavored by legislation to solve an economic problem of this character.

The nature of the work with which this department is charged, such as moth suppression, forest fire prevention and the various branches of forestry endeavor, enabled the department to begin operations immediately, and several hundred men were given employment in moth-suppression and forestry work. While the resolve gave to the State Forester the authority to appoint special police officers as a safeguard against possible trouble of any nature, he did not exercise this right, the organization of the field force of the department being sufficient to make such a course unnecessary. In fact, the knowledge and efficiency of the State Forester's agents and assistants, together with the plan of co-operation entered into between the officials of cities and towns and the department, made it possible to apply practically the entire appropriation to labor, without any overhead charges.

In the discharge of the duty imposed upon him by the resolve the State Forester not only endeavored to carry into effect the real spirit and purpose of the Legislature, — the employment of needy persons, — but applied the funds to the promotion of such branches of the forest service of the Com-

monwealth as would in his opinion be of the greatest and most permanent benefit to the State. The work accomplished, both in amount and quality, far exceeded his expectations. Co-operating with the Massachusetts committee to promote work, arrangements were made with the local committees in most of the cities and towns insuring the employment of those needy persons most worthy to become beneficiaries under the legislation, and in a majority of the cities and towns it was left with the overseers of the poor to determine those who should be selected for work, as in the discharge of their duties as officials they were enabled to have a much more intimate knowledge of local conditions than could any one else.

It was the aim of the State Forester to distribute the funds as equitably as possible among the various cities and towns, and in those cities and towns where there was insufficient moth and forestry work to be done to meet the demands of the unemployed situation men were transferred to other cities and towns. This plan was followed in the case of Clinton, Weymouth, Natick, Framingham, Quincy and many other places, and worked out perfectly satisfactorily.

The work carried on under this special legislation had progressed but a few weeks when its value as a relief measure obtained general recognition, and the Governor in a special message to the Legislature earnestly recommended that an extra appropriation of $50,000 be made available for the use of the State Forester, in order that the work might be continued until such time in the spring as the demand for labor in agricultural and other outdoor pursuits would result in reducing the tension of the unemployed problem. The text of the message is as follows: —

I have received from the State Forester a report of the doings of his department in connection with the expenditure of the special appropriation of $50,000 entrusted to him by chapter 2 of the resolves of the present year. He states that the appropriation, supplemented by certain sums received from municipalities and private citizens in payment for work done, has enabled him to give work to some 1,200 persons who otherwise would have been without employment, and that their services have been satisfactory beyond his expectation.

The appropriation will be exhausted, at the present rate of expenditure, in about three weeks, while the end of the need for special provisions for relief of unemployment is not yet in sight.

I recommend, therefore, that an additional appropriation of $50,000 be placed at the State Forester's disposal, to be expended by him in providing employment for needy persons in accordance with the terms of the original resolve.

The Legislature, acting promptly on the suggestion contained in the message, passed a resolve authorizing the expenditure of $50,000, said sum to be in addition to any amounts previously authorized, and this resolve was approved by the Governor March 19, 1915. After several conferences with representatives of the committee on the unemployed, appointed by the Governor, the State Forester induced many woodland owners to undertake forest-thinning operations, which resulted in the vast improvement of between 1,000 and 2,000 acres of forest land, the cost of such work being divided between the owner and the State. The activity of the division moth superintendents in arousing the interest of property owners in this character of work was very commendable, and much appreciated by the State Forester. The amount of money received from private individuals was about $15,000, and this allowed the continuance of the relief of the unemployed several weeks longer than would otherwise have been possible.

The State Forester desires to express his grateful appreciation of the cordial spirit of co-operation shown by the various cities and towns, which was manifested in many ways. Many towns and cities, and in some instances individuals, furnished without cost the transportation of men to and from work where long distances made such transportation necessary.

STATEMENT SHOWING AGGREGATE NUMBER OF MEN EMPLOYED EACH WEEK AND COST OF PAY ROLLS.

WEEK ENDING —	Number of Men.	Amount of Pay Rolls.
Feb. 13,	101	$477 10
18,	553	3,110 70
25,	1,254	6,605 90
Mar. 4,	1,422	10,181 05
11,	1,356	10,102 20
18,	1,297	9,263 39
25,	1,220	9,081 62
Apr. 1,	1,313	9,587 02
8,	1,348	8,470 06
15,	1,432	10,745 63
22,	1,315	9,379 32
29,	1,114	8,406 30
May 6,	961	5,241 61
14,	317	2,346 43
21,	264	2,052 99
28,	209	1,434 71
June 3,	153	1,027 55
10,	100	783 20
17,	104	822 00
24,	67	482 20
July 2,	5	43 00
9,	22	148 70
16,	6	73 00
23,	3	42 00
30,	13	240 10
Aug. 7,	1	15 00
14,	10	151 74
21,	8	102 80
28,	4	76 00
Sept. 4,	2	18 40
11,	2	13 40
16,	12	41 80
Oct. 23,	11	129 30
30,	5	37 40
Nov. 6,	3	29 80
13,	19	179 90
20,	48	415 25
27,	73	513 75
Miscellaneous,	–	22 22
		$111,912 54

TABLE SHOWING WORK DONE BY UNEMPLOYED IN DETAIL.

	Maximum Number of Men employed.	Number of Miles of Roadside cleared.	Number of Acres of Woodland thinned.	Acres of Brush burned.	Brushing and Planting (Acres).	Cords of Wood cut.	Work.	Amount expended.
Acton,	8	3	–	5	–	–	Gypsy moth,	$333 08
Amesbury,	3	2	–	–	–	–	Gypsy moth,	128 40
Amherst,	9	–	–	–	–	–	Fire work,	299 20
Andover,	28	7	8	–	–	–	Gypsy moth,	2,536 36
Ashburnham,	6	5	–	–	–	–	Gypsy moth,	515 90
Whitney lot,	9	–	–	–	65	–	Reforestation,	456 37
Athol,	27	–	–	–	–	–	Fire work,	300 00
Attleboro,	20	–	–	–	–	–	Gypsy moth,	999 00
Brochu lot,	–	–	–	–	25	–	Reforestation,	347 38
Auburn,	7	10	–	–	–	–	Fire work,	100 00
Ayer,	5	2½	–	–	2	–	Gypsy moth,	223 35
Barnstable,	22	15	–	–	–	–	Gypsy moth and creosoting.	2,065 41
Bedford,	4	4½	–	8	–	12	Gypsy moth,	344 93
Belchertown,	10	–	–	–	–	–	Fire work,	192 40
Berlin,	20	3	2	–	–	–	Gypsy moth,	193 53
Billerica,	5	10	–	10	–	–	Gypsy moth,	494 70
Bolton,	22	7	–	–	–	–	Gypsy moth,	592 87
Boston (tuberculosis hospital).	10	–	–	–	–	–	Gypsy moth,	625 50
Bourne,	7	7	–	–	–	–	Gypsy moth and creosoting.	503 00
Boxborough,	7	1½	–	–	–	–	Gypsy moth,	342 47
Boxford,	5	6	–	–	–	–	Gypsy moth,	432 85
Boylston,	6	6/10	–	–	–	25	Gypsy moth,	178 80
Braintree,	20	–	60	–	–	200	Gypsy moth,	781 30
Bridgewater,	6	–	5	–	3	–	Gypsy moth,	267 05
Brockton,	100	2	12	–	–	75	Gypsy moth,	1,812 50
Burlington,	3	5	–	–	–	–	Gypsy moth,	208 10
Carlisle,	2	6	–	10	–	–	Gypsy moth,	191 20
Carver,	12	4½	55	–	–	127	Gypsy moth and creosoting.	980 05
Chelmsford,	5	7	–	15	–	25½	Gypsy moth,	393 85
Chester,	4	–	–	–	–	–	Fire work,	201 00
Chicopee,	30	–	–	–	–	–	Fire work,	1,043 20
Danvers,	6	5	–	–	–	–	Gypsy moth,	467 20
Dracut,	7	8	–	8	–	–	Gypsy moth,	517 50

TABLE SHOWING WORK DONE BY UNEMPLOYED IN DETAIL — *Con.*

	Maximum Number of Men employed.	Number of Miles of Roadside cleared.	Number of Acres of Woodland thinned.	Acres of Brush burned.	Brushing and Planting (Acres).	Cords of Wood cut.	Work.	Amount expended.
Dudley,	6	10	–	–	–	–	Fire work,	$200 00
Duxbury,	5	¾	–	–	–	10	Gypsy moth,	157 00
Easthampton,	27	–	–	–	–	–	Fire work,	288 20
Falmouth,	7	–	3	–	–	–	Gypsy moth, creosoting and inspection.	654 40
Fall River,	32	–	–	–	–	–	Gypsy moth, fire lines, road building.	4,466 90
Fitchburg,	30	20	–	–	–	–	Gypsy moth,	2,105 90
Forest fire work,[1]	–	–	–	–	–	–	Fire work,	923 40
Framingham,	20	–	30	–	–	–	Gypsy moth,	1,745 20
Gardner,	8	–	–	–	–	–	Fire work,	200 00
Greenwood lot,	–	–	–	–	85	–	Reforestation,	454 80
Georgetown,	5	1½	7	–	–	–	Gypsy moth,	476 00
Gloucester,	10	–	19	–	–	–	Gypsy moth,	485 60
Grafton,	10	–	–	–	–	–	Fire work,	480 35
Great Barrington,	11	3	–	–	–	–	Fire work,	250 00
Greenfield,	7	10	2	–	–	–	Fire work,	540 80
Groton,	10	9	–	–	–	–	Gypsy moth,	752 40
Groveland,	5	4	–	–	–	–	Gypsy moth,	377 20
Hadley,	8	10	–	–	–	–	Fire work and 2 acres roadside planted.	306 65
Halifax,	2	–	–	–	–	–	Fire work,	108 50
Hamilton,	10	–	20	–	–	–	Gypsy moth,	1,018 48
Hanover,	5	10	–	–	–	–	Gypsy moth,	161 20
Hanson,	5	1¾	–	–	–	10	Gypsy moth,	176 35
Harvard,	6	½	–	–	–	–	Gypsy moth,	164 05
Haverhill,	8	7½	–	–	–	–	Gypsy moth,	1,047 40
Hingham,	10	–	25	–	–	50	Gypsy moth,	382 75
Holyoke,	–	–	–	–	50	–	Reforestation,	980 00
Water board,	22	–	–	–	–	–		
Hopkinton,	9	–	–	–	40	–	Reforestation,	952 19
Hubbardston,	–	–	–	40	–	–	Reforestation,	326 60
Morgan lot,	5	–	–	–	–	–		
Hudson,	20	10	70	–	10	–	Reforestation and gypsy moth.	1,591 91
Ipswich,	4	6½	–	–	–	–	Gypsy moth,	259 80

[1] Telephone and fire lines.

TABLE SHOWING WORK DONE BY UNEMPLOYED IN DETAIL — *Con.*

	Maximum Number of Men employed.	Number of Miles of Roadside cleared.	Number of Acres of Woodland thinned.	Acres of Brush burned.	Brushing and Planting (Acres).	Cords of Wood cut.	Work.	Amount expended.
Kingston,	7	2¼	2	–	38	–	Reforestation and gypsy moth,	$933 84
Holmes lot,	–	–	–	–	15	–		
Lancaster,	9	–	–	–	–	–	Reforestation,	1,718 33
Blood lot,	–	–	–	–	15	–		
Leicester,	8	–	–	–	–	–	Fire work,	191 60
Leominster,	9	6	–	–	–	–	Gypsy moth,	568 30
Lexington,	6	4	–	15	–	–	Gypsy moth,	511 17
Lowell,	22	3	–	120	–	147½	Gypsy moth,	1,784 50
Ludlow,	9	15	–	–	–	–	Fire work,	236 80
Lunenburg,	10	9	–	–	–	–	Gypsy moth,	344 75
Lynn,	20	–	400	–	–	–	Gypsy moth,	1,801 20
Lynnfield,	4	–	14	–	–	–	Gypsy moth,	400 40
Marblehead,	3	6	–	–	–	–	Gypsy moth,	224 00
Marlborough,	40	10	–	100	6	–	Reforestation and gypsy moth,	3,455 28
Brown lot,	–	–	–	–	70	–		
Marshfield,	8	3	–	–	–	–	Gypsy moth,	148 40
Mashpee,	10	5¾	33½	–	–	34	Gypsy moth,	821 58
Methuen,	7	4	–	–	–	–	Gypsy moth,	661 60
Middleborough,	25	3¾	–	–	–	100	Gypsy moth,	834 10
Middleborough,	4	–	–	–	–	–	Forest fire,	146 00
Middleton,	3	–	9½	–	–	–	Gypsy moth,	259 60
Milford,	13	–	–	–	–	–	Fire work,	349 00
Millbury,	7	–	–	–	–	–	Fire work,	100 00
Monson,	8	–	–	–	–	–	Fire work,	204 80
Montague,	12	–	–	–	–	–	Fire work,	149 60
Mount Washington,	5	–	–	–	–	–	Fire work,	295 20
Natick,	50	–	80	–	–	–	Gypsy moth,	2,350 80
Needham,	20	–	35	–	–	–	Gypsy moth,	1,150 80
New Bedford,	28	–	–	–	–	–	Gypsy moth,	1,883 20
Newbury,	5	–	25	25	–	–	Gypsy moth,	561 20
Newburyport,	10	4	–	–	–	–	Gypsy moth,	1,036 00
North Andover,	5	4½	–	–	–	–	Gypsy moth,	646 20
North Attleborough,	26	–	–	–	–	–	Gypsy moth,	1,253 90

TABLE SHOWING WORK DONE BY UNEMPLOYED IN DETAIL — *Con.*

	Maximum Number of Men employed.	Number of Miles of Roadside cleared.	Number of Acres of Woodland thinned.	Acres of Brush burned.	Brushing and Planting (Acres).	Cords of Wood cut.	Work.	Amount expended.
North Brookfield,	11	–	–	–	–	–	Fire work and reforestation.	$411 55
North Reading,	3	3	–	8	–	–	Gypsy moth,	344 80
North Shore work (Beverly, Essex and Manchester).	82	8¼	25	–	–	–	Gypsy moth,	5,525 40
Northborough,	22	10	–	½	–	170	Gypsy moth,	1,304 90
Norwell,	5	¼	–	–	–	20	Gypsy moth,	64 10
Norwood,	25	–	60	–	–	–	Gypsy moth,	1,703 80
Orange,	28	20	–	–	–	–	Fire work,	599 20
Oxford,	8	12	–	–	–	–	Fire work,	294 40
Palmer,	10	13	–	–	–	–	Fire work,	400 00
Peabody,	10	1	24¼	–	–	–	Gypsy moth,	861 90
Pembroke,	11	½	15	–	–	23	Gypsy moth,	420 20
Pepperell,	10	6½	–	–	–	–	Gypsy moth,	1,038 10
Pittsfield,	18	–	–	–	–	–	Fire work,	307 20
Plymouth,	20	6	–	–	–	–	Gypsy moth,	1,607 80
Plympton,	10	2½	2½	–	–	46½	Gypsy moth,	981 50
Princeton,	7	3½	–	–	–	75	Gypsy moth,	434 40
Reading,	2	9	–	35	–	–	Gypsy moth,	678 80
Rehoboth,	6	–	–	–	–	–	Fire work,	110 00
Rockport,	3	4	–	–	–	–	Gypsy moth,	247 40
Salem,	10	–	18	–	–	–	Gypsy moth,	852 00
Salisbury,	4	2	6	3	–	–	Gypsy moth,	373 60
Sandwich,	5	–	2	6	–	–	Creosoting and gypsy moth.	422 20
Saugus,	6	–	12	–	–	–	Gypsy moth,	523 20
Scituate,	5	2	–	–	–	–	Gypsy moth,	199 81
Sheffield,	5	–	–	–	–	–	Fire work,	176 40
Shelburne Falls,	2	–	–	–	–	–	Fire work,	69 60
Shrewsbury,	9	4 1/10	–	–	–	45	Gypsy moth,	389 20
Spencer,	8	9	–	–	–	–	Reforestation,	995 46
Springfield,	31	–	–	–	–	–	Fire work,	817 60
Sterling,	16	14	–	–	–	–	Gypsy moth,	1,440 43
Stoughton,	20	–	12	–	–	26½	Gypsy moth,	401 20
Stow,	6	1	–	–	–	–	Gypsy moth,	156 65

TABLE SHOWING WORK DONE BY UNEMPLOYED IN DETAIL — *Con.*

	Maximum Number of Men employed.	Number of Miles of Roadside cleared.	Number of Acres of Woodland thinned.	Acres of Brush burned.	Brushing and Planting (Acres).	Cords of Wood cut.	Work.	Amount expended.
Sudbury,	5	½	–	–	–	–	Gypsy moth,	$143 65
Sutton,	8	9	–	–	–	–	Fire work,	349 00
Swampscott,	4	–	20	–	–	–	Gypsy moth,	288 80
Taunton,	24	–	–	–	–	–	Gypsy moth,	999 65
Templeton,	9	–	–	–	–	–	Fire work,	200 00
Tewksbury,	5	3	–	15	–	64½	Gypsy moth,	552 62
Tolland,	5	–	–	–	–	–	Fire work,	134 40
Topsfield,	3	¼	8	–	–	–	Gypsy moth,	250 60
Townsend,	8	5	–	–	–	–	Gypsy moth,	291 10
Truro,	2	–	–	–	–	–	Gypsy moth, Burning brush,	16 00
Tyngsborough,	5	6	–	15	–	–	Gypsy moth,	774 05
Uxbridge,	12	6	–	–	–	–	Fire work,[1]	190 50
Wales,	9	27	5	–	–	–	Fire work,	294 80
Walpole,	20	–	80	–	–	–	Gypsy moth,	2,482 90
Wareham,	5	–	–	–	–	–	Creosoting and gypsy moth.	431 20
Warren,	8	20	–	–	–	–	Fire work,	150 00
Warwick,	14	–	–	–	–	–	Fire work,	301 85
Wayland,	16	1	25	–	–	–	Gypsy moth,	966 04
Webster,	36	–	–	–	–	–	Fire work,	250 00
Wenham,	5	–	15	–	–	–	Gypsy moth,	393 80
West Bridgewater,	5	1	–	–	–	20	Gypsy moth,	196 20
West Newbury,	5	3½	–	–	–	–	Gypsy moth,	367 45
Westborough,	5	2	–	–	–	8	Gypsy moth,	140 20
Highway,	10	12	–	–	–	–	Fire work,	713 05
Tower,	5	–	–	–	–	–		
Westfield,	11	12	–	–	–	–	Fire work,	327 00
Westford,	5	3	–	10	–	1½	Gypsy moth,	381 90
Westminster,	5	3⅓	–	–	–	37	Gypsy moth,	549 80
Fenno lot,	–	–	–	–	120	–	Gypsy moth,	418 60
Westwood,	20	–	50	–	–	–	Gypsy moth,	1,183 50
Weymouth,	35	–	60	–	–	200	Gypsy moth,	1,504 20
Williamstown,	6	–	–	–	–	–	Fire work,	249 60
Wilmington,	2	6	–	20	–	35	Gypsy moth,	715 70

[1] One mile fire line, 12 miles telephone line.

TABLE SHOWING WORK DONE BY UNEMPLOYED IN DETAIL — *Con.*

	Maximum Number of Men employed.	Number of Miles of Roadside cleared.	Number of Acres of Woodland thinned.	Acres of Brush burned.	Brushing and Planting (Acres).	Cords of Wood cut.	Work.	Amount expended.
Winchendon,	20	22	–	–	–	–	Gypsy moth,	$1,191 75
State forest,	–	–	–	–	75	–	Reforestation,	
Winchester,	7	–	–	–	–	–	Gypsy moth,	36 30
Worcester,	112	2½	53	–	–	170	Gypsy moth,	3,009 00

SUMMARY.

Total number of miles of roadside cleared,	582⅒
Total number of acres of woodland thinned,	1,489¾
Total number of acres of brush burned,	613½
Total number of acres brushed and planted,	569
Total number of cords of wood cut,	1,958

FUND FOR RELIEF OF THE UNEMPLOYED.

Appropriation February 9,	$25,000 00	
Balance from 1913 and 1914 (chapter 127, Resolves of 1915),	24,547 55	
Appropriation of March 19 (chapter 2, Resolves of 1915),	50,000 00	
		$99,547 55

Contributions to November 30.

Attleboro,	$500 00	
Barnstable,	52 00	
Belchertown,	150 00	
Beverly,	30 50	
Braintree,	390 50	
Brockton,	500 00	
Carver,	109 84	
Chicopee,	400 00	
Dedham,	300 00	
Easthampton,	250 00	
Fall River,	1,500 00	
Framingham,	239 00	
Georgetown,	67 20	
Grafton,	200 00	
Greenfield,	100 00	
Hadley,	150 00	
Hamilton,	144 00	
Haverhill,	81 00	
Amounts carried forward,	$5,164 04	$99,547 55

Amounts brought forward,	$5,164 04	$99,547 55
Hingham,	50 00	
Hudson,	670 00	
Kingston,	43 22	
Lowell,	328 75	
Lynnfield,	58 50	
Mashpee,	56 90	
Marlborough,	20 00	
Prendergast Camp, Mattapan,	79 80	
Middleborough,	39 75	
Natick,	578 50	
Needham,	162 00	
New Bedford,	333 90	
Newbury,	139 29	
North Attleborough,	620 98	
North Shore Committee,	2,386 52	
Norwood,	271 89	
Orange,	100 00	
Palmer,	100 00	
Pembroke,	83 60	
Plymouth,	27 34	
Plympton,	57 50	
Shrewsbury,	30 20	
Spencer,	207 62	
Stoughton,	11 50	
Sudbury,	9 75	
Sutton,	150 00	
Taunton,	840 50	
Tewksbury,	104 75	
Topsfield,	2 50	
Wales,	150 00	
Walpole,	1,256 77	
Wareham,	15 00	
Warwick,	150 00	
Wenham,	100 00	
Wilmington,	35 00	
		14,436 07
		$113,983 62

Expenditures.

Pay roll,	$111,912 54	
Supplies,	1,106 00	
Rent,	10 00	
Stationery and postage,	50 03	
Sundries,	70 35	
		113,148 92
Balance returned to treasury,		$834 70

Private Co-operative Forestry Work.

Every year we receive numerous requests for advice on the treatment of existing woodlands and the reforestation of cut-over and waste lands from private owners. Nearly all such inquirers are advised to have these lands examined by one of the foresters from this office, in order that the advice may be given after a personal inspection of the property. Nearly every piece of woodland has characteristics peculiar to itself, and any form of general advice given through correspondence or in the office is at best unsatisfactory. During the past two years applications for examinations lying within the area heavily infested by the gypsy moth have been referred to Mr. Kneeland, forester for the moth department, and a compilation of the examinations made by him or his assistants will be found in another section of this report. Forty-five examinations, covering about 4,500 acres, have been made during the past year by the forestry branch of the State Forester's office.

On occasions we have gone further than simply giving advice, and actually superintended the work which we advised the owner to do. Owing to the fact that Mr. Haynes, who has in the past been doing most of this work, has been engaged by the State Forest Commission in making investigations and surveys for them during the greater part of the year, we have done less than usual of this operating work. Several tracts on which work was commenced last fall, and which were mentioned in the report of last year, were finished during the winter or spring. These tracts belonged to St. Augustine's Farm, Foxborough; Alfred Mellor, Cummington; Mrs. W. P. Crocker, Foxborough; Boylston Manufacturing Company, Holden; W. B. Cross, Brockton and Hanson; B. I. Gilman, Wrentham. The work on these lands consisted chiefly of thinning and brush clearing, and covered a total area of around 500 acres. During this winter we are brush clearing and thinning on a tract of 40 acres belonging to Mr. F. C. Haskins in Norwell.

List of Forest Examinations.

Name.	Town.	Area (Acres).	Problem.
Oliver Ames,	North Easton,	50	Chestnut blight.
Geo. M. Baker,	Concord,	20	Estimate.
W. A. Balch,	Dorchester,	–[1]	Insect damage.
Edward Bell,	Southampton,	200	Chestnut blight.
C. S. Bird,	Walpole,	40	Thinnings.
C. B. Bliss,	Warren,	300	Chestnut blight.
Consumptives' Hospital, Boston,	Boston,	80	Thinning.
Murray Brown,	Acton,	10	Thinning and planting.
Mr. Brewer,	Harvard,	100	Chestnut blight.
A. C. Burrage,	Halifax,	20	Planting.
M. A. Chamberlain,	Ashland,	50	Planting.
D. F. Connolly,	Methuen,	4	Planting.
Howard Constable,	Kingston,	40	Planting and thinning.
H. M. Cutler,	Holliston,	100	Taxation.
Danvers State Hospital,	Danvers,	500	Thinning and planting.
E. I. Davis,	Holden,	86	Estimate.
D. A. Donahue,	Methuen,	5	Tree diseases.
C. G. Dyer,	Ipswich,	–[1]	Tree diseases.
G. H. Ellis,	Barre,	1,000	Chestnut blight and planting.
F. C. Haskins,	Norwell,	77	Thinning and planting.
H. S. Hutchinson,	Middleton,	13	Planting.
A. E. Hastings,	Orange,	80	Planting.
Water Board,	Holyoke,	150	Planting.
J. F. Johnson,	Dana,	69	Planting.
E. D. Kendall,	Holden,	–	Estimate.
Grace Lawrence,	Westford,	10	Estimate.
Theo Manning,	Paxton,	60	Thinning.
Metropolitan Water Board,	Southborough,	50	Thinning.
Mrs. Mund,	Millis,	25	Thinning and planting.
Harry Graves,	Palmer,	50	Chestnut blight.
W. V. Baldwin,	Wilbraham,	60	Planting.
A. J. Peters,	Dover,	80	Moth thinning.
Pratt Brothers,	Belchertown,	110	Taxation.
W. E. Putnam,	Danvers,	60	Moth thinning.
E. H. Sears,	Wayland,	–[1]	Chestnut blight.
Grazia Shaw,	Northbridge,	15	Thinning.
J. S. Sills,	Shelburne,	100	Thinning and planting.

[1] Single ornamental trees.

List of Forest Examinations — *Con.*

Name.	Town.	Area (Acres).	Problem.
W. D. Sohier,	Essex,	10	Moth thinning.
Highway Commission,	Westford,	–[1]	Chestnut blight.
H. P. Tobey,	Wareham,	300	Taxation.
Water Board,	West Springfield,	300	Thinning and planting.
E. W. White,	Savoy,	31	Planting.
G. F. Whitney,	Natick,	4	Tree diseases.
Town of Williamstown,	– –	25	Thinning.
C. G. Wood,	Concord,	35	Moth thinning.

[1] Single ornamental trees.

Reforestation Work.

Because of the creation of the State Forest Commission, with its power and appropriation to purchase waste land in large areas, it was thought best to discontinue temporarily the policy of purchasing lands under the terms of the reforestation law. We say temporarily because we believe that the 125 plantations set out under the terms of the reforestation law and scattered in dozens of towns over the Commonwealth have an educational value that a few State forests, no matter how extensive, can never have, and that it would be a mistake to permanently discontinue this policy. Our area of new plantations, therefore, is not as large as it would otherwise have been, and is confined to lands that were deeded to us free of cost, with the privilege of redemption on the part of the owner. We purchased one cut-over lot on Savoy Mountain, principally because one of our fire watch towers is located upon it, and its ownership by this department is desirable. The following table gives the details of the new lots planted, which total 540 acres. It is fair to state that parts of the Johnson and the Smith lots were set out in 1914, so that the area of new planting is actually around 400 acres, as compared with 500 last year.

New Work, 1915.

Name.	Town.	Area (Acres).	Planting (Number of Trees).	Brushing (Acres).	Length of Fire Lines (Rods).
Lessie Morgan,	Hubbardston,	45	35,000	–	–
Helena Johnson,	North Adams,	100	25,000	–	–
Irving Smith,	Ashburnham,	160	60,000	30	–
Irving Smith,	Ashburnham,	40	33,000	–	–
Allen Hastings,	Orange,	11	11,000	–	10
Philander Holmes,	West Brookfield,	46	45,000	–	–
Marcus Browne,	Marlborough,	33	30,000	33	–
Addie Browne,	Marlborough,	45	45,000	45	–
Chris Hansen,	Marlborough,	–	–	–	356
D. W. Gaskill,	Upton,	60	35,000	–	–
Totals,		540	319,000	108	366

In addition to the new planting it is necessary each year to do what we call maintenance work. Brush must be cut where it is choking the growing pines; blanks in the stands caused by natural death must be filled up; and plantations burned by fire must be replaced. Last winter the Legislature appropriated $100,000 for the relief of the unemployed, and $6,000 was turned over to the forestry branch for use in our State plantations. This additional sum made it possible to do work which we otherwise could not have afforded to carry out. As the appropriation was used during the winter season the only work carried out was brushing, and that only on such lots as were near enough to town for the men to go back and forth to work. Lots in Gardner, Ashburnham, Marlborough, Lancaster, Kingston, Attleboro and Spencer were cleared by the use of money from this fund. The total area of the lots on which maintenance work was done amounted to 1,200 acres, 600 of which were brush-cleared. Lots in Yarmouth, Dennis, Attleboro and Oakham which had been burned over were replanted, and a total of 325,000 trees were used in replanting burned lots or filling in plantations. The following table gives the detail data of the maintenance work: —

Maintenance Work, 1915.

Lot No.	Town.	Area (Acres).	Filling in (Number of Trees).	Brushing (Acres).	Length of Fire Lines (Rods).
1	Westminster,	40	9,000	40	–
2	Westminster,	40	–	25	–
14	Westminster,	30	–	15	–
79	Gardner,	79	60,000	–	–
104	Groton,	13	1,500	–	–
105	Groton,	5	500	–	–
84	Nantucket,	83	30,000	–	–
70	Norwell,	11	3,000	11	–
42	Hubbardston,	108	–	100	–
113	Medfield,	28	6,500	8	–
55	Dennis,	20	23,000	20	–
62	Yarmouth,	21	22,500	–	–
63	Lancaster,	74	5,000	74	–
66	Lancaster,	9	–	9	–
40	Ashburnham,	14	7,500	–	–
9	Ashburnham,	66	–	35	–
20	Paxton,	55	4,000	50	–
44	Holden,	50	–	40	–
12	Spencer,	23	–	23	–
45	Brookfield,	37	10,000	37	–
48	Kingston,	14	3,000	10	–
16	Westminster,	25	–	–	105
11	Spencer,	45	–	–	148
80	Oakham,	55	20,000	–	–
92	Spencer,	80	40,000	–	–
109	Spencer,	40	18,000	10	–
69	Attleboro,	24	25,000	24	–
51	Hopkinton,	109	25,000	35	–
49	Carlisle,	40	12,000	30	–
31	Sandwich,	20	10,000	–	–
	Totals,	1,247	325,500	606	253

PURCHASE AND PLANTING OF FOREST LANDS.

Appropriation for 1915,		$10,000 00
Expenditures: —		
Purchase of land,	$230 00	
Seedlings,	100 00	
Tools and equipment,	276 10	
Labor,	8,792 11	
Traveling expenses,	219 09	
Teaming, express, freight, etc.,	382 20	
Stationery and postage,	50	
		$10,000 00

NURSERY WORK.

The close of the season finds us in an excellent position, with a larger amount of stock on hand than ever before. This is fortunate, because the demand promises to be greater next spring than in any previous year.

Our first nursery at Amherst was established in 1905 for the purpose of raising stock to be sold at cost to private landowners. As forest planting-stock must be two years old at least, to be salable, no stock was sold from this nursery until 1907, when a small amount was available. This policy was continued in 1908, but in the legislative session of that year the reforestation law, so called, which provided for the taking over and planting of large amounts of waste land, was enacted, so that our entire output was consumed in this work, and we discontinued the sale of stock. In 1912 the Legislature passed an act requiring the State Forester to supply the other State departments and institutions with forest planting-stock free of charge. The demand from this source was unexpectedly large, exceeding our own, and we have not yet been able to meet it fully. In 1914 the Legislature created a State Forest Commission, with power to purchase large tracts of waste lands. When this commission carries out the terms of this act it will have acquired, during the next four years, nearly 20,000 acres of waste land, most of which will need to be reforested. To plant this area will require not less than 15,000,000 transplants in addition to the 1,000,000 or more per year needed for the present work. As our present output is about 1,000,000 trans-

plants per year, the possibilities of increasing this output are giving us considerable concern. As the demands upon our nurseries have grown, and as they have been increased in size, we have naturally had to spend more money in their development and maintenance, so that while in 1912 our nursery account was about $5,000, in the past year it was about $10,000. This money comes from an appropriation of $20,000 made for the general expenses of the forestry branch of the State Forester's office, covering salaries of assistants, clerk hire, traveling expenses, office expenses and printing, as well as nursery work. Where such a considerable proportion of this money is devoted to nursery work we are obliged to curtail on other lines, since the remaining half of the appropriation has to be devoted to purely administrative duties in overseeing reforestation work, nursery work, State forest reservations and the private cooperative work. Under the present circumstances it is not possible to make any scientific investigations of tree growth, surveys of forest conditions, or investigations of markets, — matters which it is the province of a State forest department to seek information about and to publish for the benefit of the people. It is urged, therefore, that the appropriation for the nursery and general expenses of the forestry branch, which is now $20,000, be substantially increased.

The Barnstable nursery has passed through the second year of its existence, and the entire 6 acres are under cultivation. Next spring it will yield results in the form of more than a million two-year seedlings ready to transplant, and half a million transplants which can be used in field planting if necessary. We took out of this nursery 75,000 transplants for planting during the spring.

The Amherst nursery has been our chief source of supply, as in the past. We have taken out 900,000 seedlings and transplants for field planting this year. The tables show in detail where this stock was used. Our inventory shows that we have on hand 360,000 four-year transplants, 290,000 three-year transplants, and upwards of 2,000,000 two-year seedlings. We do not attempt to count the one-year-olds.

During the winter we tore down three unsightly shanties which were used for living quarters for men and storehouses,

and replaced them by a small one and a half story cottage house. The lower floor contains a workshop, storeroom and superintendent's office, while the upper contains living quarters for the crew. Our own men did all the work of erecting the building.

The Amherst nursery serves as a general headquarters of our planting as well as nursery work, so that we were in need of an adequate building to serve as storehouse and workshop.

Owing to the fact that we were short of two-year seedling stock this last spring, no attempt was made to extend the nursery at the Bridgewater State Farm. The stock already there is doing finely, and with an abundance of seedling material next spring we plan to put in at least a million transplants. The great advantage of this nursery is the fact that the labor outside of the supervision costs us nothing.

STOCK SHIPPED OUTSIDE THE DEPARTMENT.

CONSIGNEE.	Species.	Class.	Number.	Nursery.
Metropolitan Water Board,	White pine,	4-year transplants,	45,000	Amherst.
Metropolitan Park Commission,	White pine,	2-year seedlings,	100,000	Amherst.
Gardner Insane Colony,	White pine,	4-year transplants,	15,000	Amherst.
Worcester Insane Colony,	White pine,	4-year transplants,	5,000	Amherst.
Templeton Colony,	White pine,	4-year transplants,	10,000	Amherst.
Fish and Game Commission,	Red pine,	3-year transplants,	7,000	Barnstable.
Harbor and Land Commission,	Locust,	5-year transplants,	12,500	Sandwich.
Wachusett Mountain Commission,	White pine,	4-year transplants,	20,000	Amherst.
Rutland Prison Camp,	White pine,	3-year transplants,	20,000	Amherst.
New Bedford Water Board,[1]	White pine,	4-year transplants,	10,000	Amherst.
New Bedford Water Board,[1]	White pine,	3-year transplants,	50,000	Amherst.
Uxbridge Water Board,[1]	White pine,	4-year transplants,	7,000	Amherst.
Lowell Park Department,[1]	White pine,	4-year transplants,	500	Amherst.
Waltham Water Board,[1]	White pine,	4-year transplants,	1,500	Amherst.
Waltham Water Board,[1]	Red pine,	4-year transplants,	500	Amherst.
Waltham Water Board,[1]	Spruce,	4-year transplants,	500	Amherst.
Moth department,[1]	White pine,	4-year transplants,	30,000	Amherst.
Moth department,[1]	White pine,	3-year transplants,	5,000	Barnstable.
Moth department,[1]	Red pine,	3-year transplants,	3,000	Barnstable.
Moth department,[1]	Spruce,	3-year transplants,	1,000	Barnstable.
			343,500	

[1] Trees purchased.

Stock shipped for Planting on Reforestation Lands and State Forests.

Nursery.	Species.	Class.	Number.
Amherst,	White pine,	4-year transplants,	350,000
Amherst,	White pine,	3-year transplants,	174,000
Amherst,	Red pine,	4-year transplants,	42,000
Amherst,	Red pine,	3-year transplants,	25,000
Bridgewater,	White pine,	4-year transplants,	13,500
Barnstable,	White pine,	3-year transplants,	30,000
Barnstable,	Red pine,	3-year transplants,	25,000
Barnstable,	Spruce,	3-year transplants,	3,000
Barnstable,	White ash,	3-year transplants,	1,500
Hopkinton,	White pine,	5-year transplants,	25,000
Total,			689,000

Three-year seedlings white pine purchased for field planting,	30,000
Two-year seedlings white pine purchased for nursery planting,	200,000
Two-year seedlings red pine purchased for nursery planting,	50,000
Total number purchased,	280,000

Inventory of Stock, State Forest Nurseries.

Barnstable.

Species.	4-Year Transplants.	3-Year Transplants.	2-Year Seedlings.	1-Year Seedlings (Beds).
White pine,	–	215,000	200,000	200
Scotch pine,	–	–	750,000	150
Red pine,	–	100,000	50,000	25
Austrian pine,	–	35,000	50,000	45
Norway spruce,	50,000	30,000	50,000	–
European larch,	–	–	60,000	–
Balsam fir,	–	–	44,000	–
White spruce,	–	–	40,000	–
Arbor vitæ,	–	–	15,000	–
Red spruce,	–	–	15,000	–
Jack pine,	–	–	30,000	–
Western yellow pine,	–	–	4,000	–
White ash,	–	–	50,000	–
Hemlock,	–	–	–	5
Totals,	50,000	380,000	1,358,000	425

INVENTORY OF STOCK, STATE FOREST NURSERIES — *Con.*

Bridgewater State Farm.

SPECIES.	4-Year Transplants.	3-Year Transplants.	2-Year Seedlings.	1-Year Seedlings (Beds).
White pine,	115,000	–	–	–

Hopkinton.

Norway spruce,	25,000	–	–	–
White pine,	25,000	–	–	–
Total,	50,000	–	–	–

Amherst.

White pine,	207,000	202,000	1,796,000	67
Scotch pine,	–	–	104,000	–
Red pine,	120,000	19,000	90,000	41
Norway spruce,	33,000	49,000	–	18
European larch,	–	9,000	–	35
Austrian pine,	–	–	–	3
Hemlock,	–	3,500	–	–
Arbor vitæ,	–	5,750	–	–
White ash,	–	–	40,000	–
Totals,	360,000	288,250	2,030,000	164
Grand totals,	575,000	668,250	3,388,000	589

STATE FORESTER'S EXPENSES.

Appropriation for 1915,		$20,000 00
Expenditures: —		
Salaries of assistants,	$4,722 90	
Traveling expenses,	3,181 11	
Stationery and postage,	612 06	
Printing,	565 77	
Maps, photographs, books, etc.,	312 21	
Equipment, tools, etc.,	506 77	
Sundries, including teaming,	93 24	
Amounts carried forward,	$9,994 06	$20,000 00

Amounts brought forward, ...	$9,994 06	$20,000 00
Nursery account: —		
Pay roll, ...	6,798 81	
Travel, ...	24 28	
Equipment, ...	1,217 50	
Seeds and seedlings, ...	1,298 81	
Express, freight and teaming, ...	583 14	
Sundries, ...	83 31	
		19,999 91
Balance returned to treasury, ...		$0 09

State Forests.

Acts of 1914, chapter 720, provided for the creation of a State Forest Commission of three men, of whom the State Forester is one, to acquire, as the act states, "by purchase or otherwise woodland or land suitable for timber cultivation within the commonwealth at a price not to average more than five dollars per acre." Section 3 of this act goes on to say that State forests acquired under this act shall be under the control and management of the State Forester, and that he shall publish in his annual report an account of all money invested in each forest and the income and expense thereof. For this reason we include in this report an account of the management of the Otter River State forest in Winchendon, Royalston and Templeton. This forest is the only one which to date has been purchased and title passed by the State Forest Commission, so that it is the only one as yet under the management of the State Forester's department. For the activities of the Forest Commission in the investigation, survey and purchase of this and other proposed State forests you are referred to their annual report which is published as a separate public document.

The Otter River State forest, containing 1,700 acres, is located in the southwest corner of Winchendon, and runs over into adjoining portions of Royalston and Templeton. It lies on both sides of the Fitchburg railroad, commencing at a point about 1 mile west of Baldwinville and continuing for about 2 miles. The Otter River flowing northwesterly, and the Miller River flowing southerly, join in the center of the forest, and the united streams continue westerly as the Miller River.

The electric-car line between Winchendon and Baldwinville passes through the eastern section of the forest, and fair country roads make all sections accessible. This forest could not be situated in a more favorable position as regards markets for lumber. Winchendon village is one of the leading wood-using centers of the State, and lies 4 miles away, while Baldwinville, also an important wood-using center, is only 2 miles away.

The land is for the most part flat and the soil light, but not sandy. The areas purchased were largely cut-over lands or abandoned pastures. Except in portions near the railroad which have been burned, there is an immense amount of volunteer pine reproduction on this forest. Conditions for artificial planting are excellent.

One of the problems in the management of this tract is that of fire protection, owing to the fact that the railroad passes through it. Natural conditions help in this protection, because Miller River parallels the track for part of the distance and makes an efficient fire stop on one side. During the summer we constructed fire lines on both sides of the railroad and for some distance along the electric road.

At the time of the spring planting season the process of purchasing the land was going on so that it was not possible to do very much in the reforestation line, but about 70 acres were set to small pines. During the winter we will clear the brush and will be prepared to reforest 200 to 300 acres in the spring.

When one of the properties, called the Goodnow Farm, was acquired there was taken with it the farmhouse and barn. Our men have painted and made minor repairs on the house, so that it now makes an excellent headquarters camp for the men. An acre of land has been plowed up and will be used as a transplant nursery from which stock can be taken for future planting on State forest land. Seedlings for transplanting will be provided from our Amherst or Barnstable nurseries.

The following table is a financial summary of the money expended in the purchase and the development of the Otter River State forest during the past year. The first four accounts are incident to the acquiring of the land, and the money expended in this work was spent under the jurisdiction of the Forest Commission; the remaining five items are incident to the management of the property, and the money was spent

under the jurisdiction of the State Forester. Practically all the funds came from the appropriation of the Forest Commission except in the items entitled brush cutting and planting, which were taken from the unemployed fund.

Account.	Land.	Labor.	Teaming and Express.	Supplies.	Travel and Board.	Total.
Cost of land,	$7,871 34	–	–	–	–	$7,871 34
Purchase expense,	–	–	–	–	$412 35	412 35
Title examination,	–	$160 20[1]	–	–	–	160 20
Survey and setting bounds,	–	676 12	$88 59	$172 09	184 54	1,121 34
Fire lines,	–	1,023 05	12 78	9 00	19 50	1,064 28
Planting,	–	235 10	23 00	–[2]	–	258 10
Brush cutting,	–	278 20	–	8 31	–	286 51
Headquarters,	–	441 22	4 00	248 00	–	693 22
Nursery,	–	8 25	–	1 35	–	9 60
						$11,876 94

[1] This amount is incomplete, as all the bills have not been paid.
[2] Trees; 65,000 supplied from the State forest nursery without cost.

Forest Taxation.

The forest taxation law, passed in 1914, has not had the wide use which we believe it should have. To date not more than a dozen woodland owners are known to have registered their land.

We believe that there are three reasons why this law is not made use of more fully.

The first is that, on account of the length of the law and the difficulty of understanding its provisions, owners hesitate to take advantage of it. The law, however, is more simple than it appears, and this is especially true of the sections dealing with young woodland, erroneously called "plantation" in the law. In the long run it is "plantation" which should be registered and which will benefit most materially under the terms of the law. Owners wishing to register such land will leave out of consideration section 7 on the commutation tax, and they will find the taxation law easy to understand.

The second hindrance to a fuller use of the forest taxation law lies in many cases in the opposition of local assessors who,

not comprehending it, see in it only a scheme for evading taxes. They place obstacles in the path of the would-be register of land by forcing appeals to the State Forester or Tax Commissioner, by not making the necessary valuations, and in other ways delaying the game, so that the owner who might have his land classified becomes discouraged and gives up the attempt.

The third and most general reason why landowners do not seek to register their land is because under the present system woodland is habitually undervalued, and the owners are not forced by economic necessity to seek relief. This condition, however, is bound to change as years go on, for the percentage of valuation of woodlots is constantly rising, and when it approaches somewhere near full value the owner will be obliged, as a financial necessity, to cut his timber or to seek relief in registering his land under the law. We would give the owners of young timber, sprout land or plantation a hint that it will be greatly to their advantage to register their land now when it can be classified as plantation, and not to wait ten years or more when the land must be classified as woodlot.

White Pine Blister Rust.

This is a fungous disease which attacks the trunks of small pines and the smooth bark branches of larger trees, gradually girdling them and causing the death of small trees and the severe injury of the larger ones. The disease, like other rust fungi, has two hosts, — the five-needled pines and the currant and gooseberry family (*Ribes*). The spores of the plant which are produced on the pines cannot infect other pines, but must first find lodgment on the leaf of a currant, where a different form of spore results which in turn can infect the pines. The damage to currant bushes caused by this disease is very small.

This disease is a native of Europe, and has been brought into this country in importations of foreign nursery stock made prior to 1912, when a complete embargo on the importation of white pine from Europe was put into effect.

The attention of plant pathologists was first directed to the disease in 1910, and this department immediately became in-

terested, because during the previous year we had imported about half a million white pine transplants from Germany which we had set out in State plantations. Dr. Perley Spaulding, of the Federal Bureau of Plant Industry, came on and looked over some of the plantations. No signs of the blister rust were seen, but this fact was not necessarily reassuring, because a pine may have the disease several years before showing signs of it. As a matter of precaution, he advised that we look our plantations over for wild currant, and pull up all that we found. Consequently, a couple of our most intelligent laborers were instructed in this work, and during the summer went over all our plantations where the German-grown white pines had been set, and searched for wild currants.

In 1912 the State Nursery Inspector, Dr. Fernald, took up the work of investigating the status of the disease, which by that time had been found fully developed on several imported pines in Hamilton and Ipswich. We gave to his department a list of all our plantations containing imported nursery stock, and maps to show their location. As a result of his investigation infected trees were found and tagged on a plantation in Westminster. We also found a few trees on a plantation in Spencer. These trees were afterwards pulled up and burned. On these two lots in every case the infected trees were imported stock, which had the disease when they were planted. There is no evidence as yet to show that the disease has spread from these pines to currants and hence back to native pines. The State Nursery Inspector has during the past fall found the disease on currant bushes in the Housatonic valley region, and this is a more serious phase, for it indicates that the blister rust has spread from the original infected pines to the currant, and teleutospores produced on this plant are ready to spread to native pines, if they have not already done so.

Every effort should be made to keep watch on those areas known to have the disease present, both to watch its effect and to prevent the spread. Further light is needed on the status of the blister rust in Europe, for while some published authorities call it a dangerous enemy to the white pine, others pass over it in an indifferent manner. It is well to recall that the white pine is not peculiar in being subject to this disease, for

there are other forms of blister rust, and practically every species of pine that grows is subject to some one of them.

We are often asked if this disease may not prove as disastrous as the chestnut blight, and we feel safe in saying no. There is this important difference; while the chestnut disease spreads from tree to tree the blister rust must go from pine to currant and currant to pine, and this fact limits its spread. It is a disease primarily of the nursery and young plantation, and not of the wild woodland.

Chestnut Bark Disease.

No especial investigation of the spread or present status of the chestnut blight has been made during the past year. Owners of chestnut woodland have appealed to our department for advice as to treatment, and we have made many examinations of infested woodlands. These are listed under woodlot examinations in another section of this report.

The bark disease is now to be found in every section where chestnut grows. The past summer, with its abundant rainfall, was extremely favorable to the development and spread of a fungous disease similar to the chestnut blight. The extent of it will be apparent next summer.

As a sidelight upon the spread of this disease, the following, upon conditions at Mount Holyoke, is interesting: —

In September, 1912, Mr. Cook of this department made an examination of the property of the Mount Holyoke Company, and in his report made the following statement: —

I estimate that about 5 per cent. of the chestnuts are at this time dead or dying from this disease, and if it continues to increase at the same rate in the next two or three years as it has in the past year few trees will remain uninfected at the end of that time.

Three years afterward (November, 1915) Mr. Haynes of this department examined the same property, and reported that more than 90 per cent. of the trees are infected with the blight and 75 per cent. are dead or nearly so, — 5 to 90 per cent. in three years, or an increase of 1,800 per cent.

A young white pine recovering after weevil attack. A lateral branch has twice assumed an upright position after the death of the main shoot, and the mature tree will be comparatively straight.

A four-year-old white pine transplant covered with the characteristic white downy matter which conceals the pine aphid.

White Pine Weevil (*Pissodes strobi*, Peck).

The white pine weevil is doubtless the worst enemy of young white pine in this State. It is a somewhat elongate, brownish snout beetle, 4 to 5 millimeters in length. The winter is passed in the adult stage. The beetles come out of their winter quarters and fly early in May, and, after feeding for a few days on the bark of the living white pine terminal shoots, deposit their eggs in punctures in the bark of the shoot of the previous year's growth, placing one or two eggs in a pit or cavity in the inner bark made by the beak of the mother beetle. The small white grubs (larvæ) which hatch out are responsible for the damage which then occurs. They eat their way downward, killing the leader or main shoot of the tree. The white pine shows remarkable recuperative ability against weevil attack. When the main leader of a young tree has been killed one of the lateral branches gradually assumes an upright position and takes its place. Sometimes this branch is in turn killed, and many cases are known where for the second time a lateral shoot has become the leader and developed into a comparatively straight bole.

The best remedy against this pest is to cut and burn the affected shoots before the grubs have developed into adults, bored their way out and departed. Some experiments in spraying have been conducted by the Connecticut Agricultural Experiment Station, and their opinion is that, if the trees are sprayed during the few days devoted by the mother beetle to feeding, and previous to depositing the eggs, some damage may be avoided. The combination recommended is commercial lime and sulphur, 1 to 8.

An excellent treatise on this pest is by Dr. A. D. Hopkins, United States Department of Agriculture, Circular No. 90.

White Pine Aphid or Mealey-bug (*Chermes pinicorticis*, Fitch).

The pine aphid is one of the many species of plant lice, and appears on the smooth bark of young trees where it sucks the sap. The aphid is easily recognized in the form of patches of flocculent downy matter, concealing minute insects which

emerge in large numbers and travel actively over the bark for a time. When newly hatched the insect itself is so small as to be nearly invisible to the naked eye, and in the early part of May they are more abundant than at any other time. Traveling soon ceases, and they attach themselves to the tender bark of young twigs. They increase rapidly in size, assume a dark reddish brown color, and the secretion from the body commences and soon hides them from view. Maturity is reached about the last of May, and the wingless females deposit eggs for another brood. There are several broods during the summer, and the winter appears to be passed, at least in some years, by the females as adults, which emerge during the latter part of March and begin to feed. They deposit eggs early in April.

The presence of large numbers reduces the vitality of a tree and apparently leads to a sickly condition, but no great permanent damage as a rule results. The insect was first noticed by Dr. Fitch as early as 1856.

The best measure to be taken against its damage in the event that it becomes very abundant on valuable trees is to spray with kerosene emulsion. The formula is as follows: ½ pound of laundry soap, 1 gallon of water. Boil, and then add 2 gallons of kerosene. In spraying dilute with 15 parts of water.

Exhibitions.

When the citizens in any section of the Commonwealth meet together for the purpose of considering ways and means of progress and the promotion of efficiency they usually install exhibits showing the results achieved under the best methods of the present time. These exhibits cover a wide range of subjects, including all forms of agriculture and the processes of good local government. The State Forester is often requested to exhibit at these gatherings. There is a large amount of educational work to be done from year to year by means of lectures, supplemented by the use of lantern slides and moving pictures. In some cases the State Forester has caused to be installed exhibits in picture form showing the practices of forestry, and actual specimens of seedlings and transplants from the State's nurseries. Several granges throughout the

State have during the past year requested and received specimens of forest trees to exhibit to their members, and a large number of inquiries by mail has followed in the wake of these gatherings.

Two exhibitions where the State Forester has placed assistants in charge for several days are worthy of especial note. At Barnstable, where one of our nurseries is located, an exhibit was installed during the week of the Barnstable County Fair in September. Transplant beds were made on the grounds, and in a tent close by pictures showing the different lines of forest work were arranged in their respective groups. A large number of people visited the Barnstable State nursery during the week of the fair.

During the week of the Exhibition on City Planning, held at the State House November 12 to 20, the State Forester was requested to co-operate. A report of the exhibit was later requested by the committee, and a copy is herewith given: —

The State department of forestry, while not directly connected with the development of Boston, was requested to install an exhibit for the purpose of encouraging the planting of shade trees and the reclamation of waste areas of land. As the State Forester, F. W. Rane, pointed out in his address at the 3 o'clock afternoon gathering on November 18, any city might well own and control its own city forest, derive an income from it and contribute greatly to the health and pleasure of its citizens. Such a system has long been in force abroad, and has met with universal success. To this extent forestry is in harmony with all forms of city welfare. This address was illustrated with moving pictures and lantern slides.

The State Forester's exhibit, in charge of J. R. Simmons, assistant forester, consisted of three groups. The whole life history of gypsy and brown-tail moths was shown by the use of mounted specimens, supplemented by pictures showing the past and present conditions and the radical treatment of these pests as promoted by this department.

A table was devoted to showing the leading species of forest trees, from seedlings to four-year transplants. All of these were actual specimens taken from the State nurseries.

The relation of forests to rainfall was demonstrated by the use of two mountains in miniature made from sand, one barren and the other forested. Water poured upon these mounds through a large sprinkler demonstrated in a vivid way the effect of erosion.

As a background to these exhibits, a large number of pictures representing the different phases of the department's work was shown. Five large

frames of photographs were arranged to show the construction and use of a model forest fire tower. Other pictures demonstrated the reforestation of waste land and the results of reforestation at the end of from forty to fifty years. Posters urging the co-operation of all citizens, bulletins and printed matter from the State Forester's office were placed in conspicuous places to catch the eye and arouse a train of thought in the mind of the observer.

The objects of forestry are many, and the plans for the future of every great city should include not only systematic planting and care of its street trees, but a municipal forest as well.

Forestry. — Moth Work.

This past year forestry practice as applied to the moth work has become firmly established, and has been worked out with enthusiasm and success by all branches of the department, and over all the infested area. Most of the district and local moth superintendents have advocated and carried on moth thinnings with success and satisfaction. The work of the foresters in the moth department, instead of being mainly that of organizing and experimenting, as it was at the start, has become largely concerned in the management of thinning operations and the utilization of their product.

Examinations. — During the past year 43 formal examinations of woodland were made for owners who desired advice as to the handling of the moths in their tracts. Most of these examinations were followed by written reports. They covered a total of 3,706 acres, and the lands examined were situated in 35 different towns or cities. Besides these, a large number of informal examinations were made where merely advice was given and no records kept. This year a list of infested woodland throughout the State was made up as previously, but no letters or circulars were sent to the owners, as it was thought that by this time most of them were sufficiently informed about moth thinnings.

Co-operative Moth-thinning Operations.

During the year 22 moth-thinning operations were carried on in co-operation with owners of woodland. In these operations the owners paid all of the actual expenses of doing the work, and received all the returns from the products cut and

A moth thinning at Haverhill.

Chestnut poles and moth thinning in Dover.

sold. This department, however, had complete management and supervision of the work. These operations have been carried on under the best forestry practices, and have not only aided in the solution of individual moth problems, but have served as an example to be followed by other owners on their own initiative. Much of the wood and lumber cut would have gone to waste, and worse than that, the land on which it stood would have gone unused, if this department had not aided. Wherever cuttings were made, proper measures for the regeneration of the woodland were taken. These operations have shown that the moths in the woodland do not present a hopeless problem, but may result in better forests in this State in the future than would have come had not these pests come upon us. Most of these operations will yield a financial profit to the owners as well as an improved woodland.

Co-operative Moth-thinning Operations, 1915.

Name of Owner.	Location.	Area (Acres).	Character of Operation.
Constance L. Abbott,	Haverhill,	40	Portable mill.
G. M. Angier,	Marion,	30	Cordwood.
Geo. H. Barton,	Stow,	20	Cordwood, ties and logs and spraying.
Florence Cushman,	Harvard,	30	Cordwood, mostly birch.
Abbie G. Davis,	North Andover,	25	Cordwood and logs.
Arthur D. Delano,	Rochester,	40	Cordwood and logs.
Levi H. Greenwood,	Plymouth,	20	Cordwood and spraying.
Haverhill Water Works,	Haverhill,	50	Portable mill and planting.
Chas. W. Hubbard,	Auburndale,	150	Portable mill, spraying and planting.
Ellerton James,	Randolph,	50	Cordwood and chestnut posts.
C. H. Jones,	Weston,	60	Cordwood and logs.
H. A. Lamb,	Milton,	15	Cordwood and logs.
W. S. Leland,	Middleborough,	30	Cordwood and spraying.
New Bedford Water Works,	Middleborough,		Planting.
	Rochester,	400	Portable mill and spraying.
Nichols Heirs,	Haverhill,	80	Portable mill and planting.
Sarah E. Pratt,	Sudbury,	35	Portable mill.
Wm. E. Putnam,	Danvers,	60	Cordwood and logs to stationary mill and planting.
Quittacus Syndicate,	Rochester,	15	Cordwood and spraying.
Sagamore Beach,	Bourne,	50	Cordwood, spraying and planting.
Dr. H. O. Spaulding,	Hingham,	35	Cordwood, logs and piling.
Nathaniel Stevens,	North Andover,	200	Portable mill, spraying and planting.
Arthur Winslow,	Middleborough,	50	Cordwood, logs and spraying.
Total,		1,485	

On these co-operative operations $70,438.33 was spent during the past year. All of this sum was advanced by the various owners, and spent under our direction and supervision. Over

90 per cent. of this amount is for labor, and does not include certain compensating costs, as shipping, freight, etc., which are deducted from the receipts when the material is sold. The chief advantage of this expense is that although it was used in combating the moth pests, it will all come back in the sale of the 2,796,438 feet of lumber and 12,295 cords of wood that were cut. Probably the average value of the lumber would be about $18 a thousand feet, making its value a little over $50,000. At only $2 a cord the total receipts will exceed the expenditures by $5,000, and $3 would be nearer the average price obtained for the cordwood. The expense of the operations includes not only the cost of cutting the wood and lumber, but also the cost of burning the brush and of considerable spraying and planting. Thus it can be seen that this moth-thinning work pays for itself.

In an annual report there is not space enough to go into details about individual operations, but much of interest might be written. Accurate cost data of most of the operations have been kept, and it is hoped that some time a bulletin may be published which will particularize much of the practical and scientific information which has been gathered.

Utilization.

The most important developments in the moth-thinning work during the past year have been along the lines of the utilization and sale of the forest products cut. A large amount of data as well as of practical experience along these lines has been obtained. It was early seen that it would be fruitless to cut infested and dying oak trees unless the product could be sold for at least what it cost to cut it. The wood might better rot on the stump than have it rot on the ground after money has been spent to cut it. At first, when only small amounts were cut, a ready market was found, but as the volume of the work has increased, it has become increasingly difficult to dispose of the product. Almost anybody will consent to carry on a resistant thinning now if he can be assured that he can sell the product at a fair price. Thus it has developed that the scope and usefulness of the thinning work are limited only by the utilization of the products.

Cordwood, lumber, piling and logs for special uses are the main products of the moth thinnings. Oak is the chief species cut, so oak utilization is the main problem. The best and finest of all these materials find a ready market at good prices. However, most of the product of the thinnings is not the best. Most of our infested woodland is of smaller sprout growth, and much of it is already dead or badly injured by the moths. The difficulty of the situation has been further increased by the poor business conditions of the past year. The efforts at utilization have, however, been very successful, although only a start has been made. The four main lines of endeavor have been (1) investigation, (2) education, (3) substitution and (4) new markets.

An attempt has been made to find out all the principal oak users of this section of the country, to study their needs, to find out what and how much they use, and to get their individual ideas. This has resulted in some very useful data, and given us a thorough understanding of the situation from the consumer's point of view.

Education has been necessary both for the consumer and the producer. The consumer has often not known just what our native wood lumber is, and how adaptable it is to his uses. Many of the producers have been woefully ignorant as to the needs of the consumer, and have lost much thereby. In fact, the situation has come to such a pass that in many sections of the eastern part of the State the ordinary lumbermen will not handle oak at all. They buy a woodlot, cut off the pine, but leave the oak to rot or for cordwood, because they say that they cannot dispose of it as lumber. If these men were only better informed about the oak market and uses they could easily dispose of much of their oak at a greater profit than the pine.

There is a great need of education along these lines for the dealers in and consumers of cordwood. In certain sections, notably the metropolitan district, it is impossible to sell cordwood unless the wood is practically all cleft, and also it is becoming very hard to sell oak wood of any kind. This is because of a prejudice of the dealers partly inspired in them by a like prejudice in the consuming public, which wrongly requires large maple wood. Those who know, as the farmer who

has burned wood all his life, will tell you that small wood mixed with the large cleft wood makes a better fire and is more economical to burn than big wood alone. Any one can easily demonstrate this to his own satisfaction if he will try the experiment. This prejudice makes the price of wood higher and the demand smaller; also it causes a large waste of the smaller, poorer wood. The reason why it is hard to sell oak wood now is because the dealer will tell you that his customer would rather have the fast-burning maple and birch, or even pine. The consumer should know that the real hardwoods, as oak and hickory, have more fuel value, burn much longer with less sparks, and are really much more economical than the maple or birch. In localities where the inhabitants know the real value of wood as a fuel the oak commands a higher price than the maple. We believe that there is a great chance to educate the public and the dealers along these lines, and thus market much wood which is now going to waste.

Much valuable work has been done along the line of substituting our native oak for oak or other woods which were obtained from outside the State. One large railroad which formerly bought al of its car stock in the central and southern States is now buying it right here in Massachusetts. Several others — large consumers — have been shown the adaptability of our native lumber to their purposes, and are buying it here when they can get it. This substitution of native products for those grown outside the State can be carried on to a much larger extent if the producer will only take the trouble to study his markets.

Several new markets have been developed for oak products and old ones extended. No car stock had been produced in recent years in certain sections of the State until this department started sawing it out on its co-operative operations. That is just one example out of many. There is a necessity for further investigation and experiment along this line, which may yield good results.

A bulletin on oak utilization in Massachusetts is now in preparation, and when published it is hoped that it will result in the bringing of the producer and consumer together, and the profitable utilization of much that is now practically going to waste.

Co-operative Utilization.

In all the moth-thinning operations undertaken in co-operation with the owners, this department, as well as managing the operation itself, has taken charge of the utilization and sale of the products cut. It has been mainly because of this that we have been able to get a true insight into the problems of utilization as a whole. The chief trouble with the mass of publications which have been issued concerning utilization is that they are impractical, because the writer has merely investigated and tabulated figures and data, instead of trying to sell the goods he writes about so glibly. It is one thing to write the fact that the chair manufacturers are the largest single users of oak in the State, and yet an entirely different thing to cut some oak and sell it to these chair manufacturers at a good price, or to determine whether this certain lot contains material suitable to be disposed of as chair stock to the best advantage.

It is by giving practical aid and advice to the owners of woodland that this department is co-operating along utilization lines. We are actually selling the products for the owners, or, after examination of the growing stand and thorough investigation of local conditions of labor transportation and market, giving them really expert advice.

Some very effective work has been accomplished in disposing of small lots of material. For instance, a certain owner has a few large oak trees which need to be cut. There is not enough lumber in them to pay anybody to bother with it, and all that can be done, under ordinary methods, with these large oaks is to laboriously split them up into cordwood, which will not be worth the cost of chopping it. In a number of such cases this department has been able to arrange to get these oaks sawed up into lumber and sell it along with other lumber from other lots, making a total large enough for some one to bother with. The lumber has given the owner a profit for his trees instead of a loss, as would have resulted if cordwood had been the product. Wherever a portable mill has been at work on one of the co-operative operations we have been able to have small owners near by haul in their few oak logs and dispose of the product along with the rest, thus effecting a saving to them. There is a large opportunity for further efforts along this line.

On the co-operative operations which this department has managed, over $100,000 worth of products has been cut. Most of these products have been sold or are under contract of sale, the sale being due to the efforts of this department. Some have been sold directly to the consumer, and some through the regular dealer or middleman. It has been the policy to sell through usual channels where possible, so as not to compete or cut prices. Eight or 10 cars of lumber and cordwood are now being shipped each week from these various operations, and the various matters of shipment, billing and collection are handled through this office.

Finally it should be said that the co-operative utilization and marketing of forest products comprise a field which is opening up new possibilities of usefulness for this department, and if followed out will bring good results to the forest owners of the State.

The Lumber Market.

The market for native lumber is beginning to pick up. During the past year the business depression and the large stock of cut lumber unsold resulted in low prices. In certain kinds the prices dropped almost 25 per cent., while even the staples, as box boards, suffered a dollar or two reduction per thousand. However, the prosperity now coming has quickened the demand, and many kinds have nearly reached their previous prices. The amount of material actually being shipped to the war zone from this State is probably small, although a certain amount for cases, wheels, trucks, boxes, boats and perhaps a little dimension lumber is finding its way into export. In general it can be said that except for temporary depressions there will always be a good market for local lumber products, even of the poorer quality. This is the reason why forestry in the Commonwealth will prove a good investment.

Cordwood Situation.

Enough has been said in other portions of this report to show that the cordwood situation is serious. Due to cuttings on account of the gypsy moths, largely advocated by this department, there is now an overproduction. The wholesale price has dropped from $0.50 to $1.50 on a cord in many places,

Taking out the hardwoods that are the natural food of the moths. The remaining pines will aid in reseeding the ground.

All moth food trees have been taken out, leaving largely a white pine stand which will need no further expense from moth suppression. The possibilities of future values are greatly enhanced also. New Bedford waterworks property at Middleborough.

although as usual the retail price has not taken a corresponding reduction, and the dealers are reaping the benefits. It is necessary that the large production keep up, else the trees will be killed and the wood go to waste. We believe that a considerable portion of this increased production could be taken care of if the retail price could be reduced. If the dealers are unwilling to do this it may be necessary to devise some method of selling direct to the consumer at a lower price. If something is not done the farmers and forest owners will lose thousands of dollars that they can ill afford.

This department is now experimenting on new methods of cordwood utilization which may enable us to use up large amounts at a profit. Before long we hope to be able to announce success along these lines.

The State Fire Warden's Report.

Mr. F. W. Rane, *State Forester*.

Sir: — In compliance with your request, and in accord with the provisions of chapter 722, section 2, Acts of 1911, I beg to submit the following report of the work accomplished by this branch of the department this year: —

With the exception of the severe drought that occurred during the months of March and April the season has been a very favorable one. During the month of March the reports from the Weather Bureau show .06 of an inch of rainfall, establishing a record for dryness in the history of the Weather Bureau back to 1885. During this period our records show 2,393 fires with a loss of $107,995. It is very unfortunate that a drought should have occurred at this season of the year, as vegetation not having started, it made ideal conditions for forest fires. This drought lasted forty-six days, and reports from our observation stations show from 300 to 600 fires per week, a large percentage being confined to the eastern part of the State.

During the months of June and July we were able to discontinue the use of eleven of our stations, thereby allowing us to apply more of our appropriation in construction work, also to use many of our observers in this line of work.

The same arrangement of districts has been maintained as during the past two years, district No. 1 including Essex, Norfolk and Middlesex counties, No. 2, Barnstable, Bristol and Plymouth counties, No. 3, Worcester County and west to the Connecticut River, and No. 4, Berkshire County and east to the Connecticut River.

Two changes have been made in the personnel of this branch of the department. Mr. Miner E. Fenn, formerly assistant in this office, was

made locomotive inspector, and was succeeded in the office by Miss Josepha L. Gallagher, who was transferred from the moth department.

We have erected six steel towers as follows: through the courtesy of Mr. S. B. Pearmain, owner of Nobscot Hill in Sudbury, we were allowed to lease the top of this hill for a term of years, and have erected a 40-foot steel tower with a 10-foot room. This is an important station, as it covers a large amount of forest area that has been more or less subject to forest fires. The towns of Sudbury, Weston, Wayland and Framingham each contr buted $100 towards this tower.

The 30-foot tower in Westborough has been replaced by a 60-foot tower, thus allowing a better outlook and covering this territory much better than with the former tower. The town of Westborough contributed $100, and Upton and Grafton $75 each, towards this tower.

A new 40-foot tower was erected on Barden's Hill in Middleborough, the town of Middleborough contributing $150 and Carver $100 towards this tower.

As the 60-foot tower erected last year on Copecut Hill in Fall River covers territory formerly partially protected by Richmond Hill tower in Dighton, I found it advisable to move the 30-foot Richmond Hill tower to Great Meadow Hill in Rehoboth, adding 16 feet to the height of it, thereby better protecting the forest area in Taunton, Attleboro and Norton. Taunton, Attleboro and Rehoboth each contributed $100 towards this tower, and Norton $50.

Through the courtesy of Mr. Charles Robinson of Providence, R. I., we were allowed to lease the top of Wigwam Hill in Mendon, and have erected a tower there similar to the others. Aside from the area covered in Massachusetts from this tower, we also cover some of the most valuable woodland in the State of Rhode Island. This tower also covers a portion of the so-called "Douglas Woods."

A new 30-foot tower with stairs was erected on Berlin Mountain in Williamstown. This is a co-operative tower, being maintained jointly by New York, Vermont and Massachusetts. This covers the west side of the Greylock Range and valuable timber land in the adjoining towns, as well as a large amount of forested area in Vermont and New York. The residents of Williamstown have subscribed $150 for the stairs of this tower.

A 40-foot tower was erected on Lenox Mountain in the town of Lenox. This covers a large portion of the so-called Whitney Reserve, as well as valuable holdings in the adjoining towns. The residents of the towns of Richmond, Lenox and Pittsfield have subscribed $200 in payment of the stairs of this tower.

A co-operative 30-foot steel tower with stairs was erected on Mount Everett. This tower is maintained jointly by Connecticut, New York and Massachusetts, and covers a large amount of forest area in the three States. The town of Great Barrington contributed $150 in payment of the stairs of this tower.

These new towers all have a 10-foot square room at the top, equipped with our sliding map-table and long-distance telephone connection.

This construction work has been done entirely by our district forest wardens and observers. We maintained our own camping outfit, thereby lessening the expense of construction very materially.

Since our fire season closed our men have been constructing telephone lines. A new line is being constructed from Seaside to Monk's Hill in the town of Kingston, a distance of about 2 miles, where we shall locate a 30-foot tower this coming year, probably doing away with the Plymouth tower as a permanent station. We are also constructing 3 miles of telephone line to Lair's Hill in the town of Tolland, where we shall put the 30-foot tower now in use on Becket Mountain, adding 20 feet to its height, thus making a 50-foot tower. I also desire to locate a 40-foot tower on Holcomb's Hill in Chester, which will complete our observation tower system in the Berkshire district. A new tower should also be established on Watatic Mountain in the town of Ashby, which will cover the recently purchased State reservation in the town of Winchendon, a large portion of forest lands in Ashburnham, Ashby, Townsend and Fitchburg, as well as valuable woodlands in New Hampshire. A portion of the maintenance of this tower would be paid by New Hampshire.

Owing to our discontinuing the use of the Blue Hill observation station it is necessary that a station be located on Prospect Hill in Hingham, which will protect the east side of the Blue Hills Reservation. The tower on Moose Hill in Sharon protects the west side.

The new slash law which became effective January 1 is giving general satisfaction. Owing to the many stationary sawmills, wood-using industries and 221 portable sawmills in operation during the year it is necessary that the law be strictly enforced. As the operation of it is entirely in the hands of the forest wardens it has been a difficult problem to have it enforced in every instance, as I would desire. In many cases I find that, owing to local conditions and possibly some personal reasons, some wardens have desired to place the responsibility of carrying out this law upon this department, and while we would be glad to assume it, our authority is simply in an advisory capacity. Our district wardens have, however, visited many towns and seen that the law was properly adhered to. I feel confident that in the coming year we shall experience very little trouble in enforcing this law throughout the State.

The permit law, which has been in operation for the past few years, has also given general satisfaction, 24,507 permits being issued. We have had some trouble in prosecuting violators of this law, owing to the law being amended two years ago, and many judges holding that while the towns accepted the act in the first instance, they never have accepted it as amended, and for this reason many cases have been thrown out of court.

Reports received from forest wardens show that 65 parties were prosecuted for violating this law, 18 of whom were convicted, 30 were allowed to settle by paying the expense of extinguishing, and 17 were discharged.

As there are less than 20 towns that have never accepted this act, it seems that it would be advisable to recommend to the General Court that the law be further amended, making it apply to every town in the Commonwealth. This would not only do away with any question that might arise in enforcing it, but would make the law general throughout the State.

FIRES REPORTED FROM OBSERVATION STATIONS.

	1914.	1915.
Baldpate Hill, Georgetown,	–	213
Barden's Hill, Middleborough,	133	128
Becket Mountain, Becket,	63	46
Berlin Mountain, Williamstown,	–	56
Blue Hill, Milton,	236	–
Bluff Head, Sharon,	203	280
Bonney Hill, Hanson,	68	167
Bournedale, Bourne,	54	114
Copecut Hill, Fall River,	33	453
Cran Pond Hill, Ashfield,	2	24
Everett Mountain, Mount Washington,	–	3
Fay Mountain, Westborough,	386	530
Grace Mountain, Warwick,	94	36
Great Meadow Hill, Rehoboth,	105	101
Hart Hill, Wakefield,	174	263
Harwich, Harwich,	35	31
Howland's Hill, Falmouth,	1	13
Lincoln Mountain, Pelham,	47	59
Massaemet Mountain, Shelburne Falls,	130	104
Morse Hill, Essex,	96	272
Mount Tom, Easthampton,	135	72
Nobscot Hill, Framingham,	–	98
Reservoir Hill, Plymouth,	116	102
Robbins Hill, Chelmsford,	302	276
Shoot Flying Hill, Barnstable,	14	42
Steerage Rock, Brimfield,	90	86
Tower Mountain, Savoy,	11	13
Wachusett Mountain, Princeton,	485	598
Totals,	3,013	4,180

Forest Fires of 1915.

Months.	Number.	Acres.	Cost to extinguish.	Damage.
1914.				
December,	9	1,229	$29 00	-
1915.				
January,	-	-	-	-
February	37	121	204 00	$33 00
March,	1,630	16,877	16,909 00	47,792 00
April,	763	21,640	12,889 00	60,203 00
May,	283	7,047	4,227 00	23,440 00
June,	119	684	1,306 00	8,150 00
July,	16	56	130 00	10 00
August,	6	10	27 00	18 00
September,	19	14	98 00	25 00
October,	47	191	262 00	142 00
November,	79	520	702 00	1,260 00
Totals,	3,008	48,389	$36,783 00	$141,073 00

Types of Land burned Over (Acres).

	1914.	1915.
Timber,	3,001	3,817
Second growth,	9,016	6,749
Second growth, not merchantable,	7,943	9,107
Brush,	11,645	14,681
Grass,	3,510	8,128
Not classified,	4,860	5,907
Totals,	38,975	48,389

Types of Classified Damages.

	1914.	1915.
Standing trees,	$50,697 00	$73,782 00
Lumber, logs, cordwood,	14,427 00	23,544 00
Buildings, bogs, etc.,	3,530 00	31,904 00
Bridges, fences,	331 00	1,936 00
Not classified,	26,404 00	9,907 00
Totals,	$95,389 00	$141,073 00

Comparative Damages by Forest Fires for the Past Six Years.

Year.	Number of Fires.	Acreage burned.	Cost to extinguish.	Damage.	Average Acreage per Fire.	Average Damage per Fire.
1910,	1,385	42,221	$23,475	$205,383	30.46	$148 29
1911,	2,356	99,693	47,093	537,749	39.31	226 24
1912,	1,851	22,072	20,219	80,834	11.92	43 67
1913,	2,688	53,826	35,456	178,357	20.02	66 35
1914,	3,181	38,975	48,750	95,389	12.25	29 98
1915,	3,008	48,389	36,783	141,073	16.08	46 90

Classified Causes of Forest Fires for the Past Four Years.

Causes.	1912.		1913.		1914.		1915.	
	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
Unknown,	649	31.1	650	24.2	1,174	37.0	1,134	37.7
Railroad,	640	34.6	913	34.0	830	26.0	777	25.8
Burning brush,	93	5.0	148	5.5	196	6.2	439	14.5
Hunters, smokers,	223	12.0	386	14.3	520	16.4	5	.1
Steam sawmills,	8	.4	6	.2	3	.1	129	4.2
Children,	79	4.3	109	4.1	140	4.4	161	5.3
Miscellaneous,	159	8.6	476	17.7	318	9.9	363	12.4
Totals,	1,851	100.0	2,688	100.0	3,181	100.0	3,008	100.

Precipitation in Inches for the Years 1911, 1912, 1913, 1914 and 1915, with December of Previous Year.

Months.	1911.	1912.	1913.	1914.	1915.	Normal.
December,	3.24	2.59	5.73	3.66	4.56	3.74
January,	3.07	3.87	3.21	4.30	7.38	4.12
February,	3.20	2.24	3.77	3.52	4.30	3.97
March,	3.27	5.26	5.32	4.20	.06	4.34
April,	2.86	4.05	4.73	5.51	2.44	3.46
May,	.89	4.03	2.85	2.95	2.01	3.37
June,	4.76	.53	3.20	1.75	1.43	3.07
July,	4.55	4.16	2.00	3.38	9.52	3.65
August,	6.70	3.85	3.30	4.59	4.83	3.70
September,	3.36	1.71	2.77	.45	.74	4.36
October,	3.01	1.52	7.62	2.03	3.11	4.13
November,	5.71	3.45	2.70	3.06	2.47	3.96
Totals,	44.62	37.26	47.20	39.40	42.85	45.87

Railroad Fires.

Our railroad fire reports show 777 railroad fires, as follows: Boston & Albany, 156; Boston & Maine, 261; Central Vermont, 58; and New York, New Haven & Hartford, 302, burning over 7,543 acres, with a cost for extinguishing of $7,782 and a damage of $32,624. Owing to the severe drought during the spring this damage exceeds that of former years, while the number of fires remains practically the same.

The reports received from our locomotive inspectors show 901 inspections made of front-end screens and ash pans, with the following results: —

Boston & Albany, 101 locomotives inspected, 25 of which were defective; Boston & Maine, 321 inspected, of which 39 were defective; New York, New Haven & Hartford, 479 inspected, of which 87 were defective. In nearly all instances these were but minor defects and were promptly repaired.

The following reports from Mr. Ryder of the Boston & Maine, and Mr. Chas. B. Rood of the New York, New Haven & Hartford, show work accomplished by these roads during the year: —

Mr. M. C. Hutchins, *State Fire Warden, Boston, Mass.*

Dear Sir: In accordance with your request for a statement of our work during the past season, we beg to submit the following: —

With the passing of February the ground was left frozen and dry without a vestige of snow, and March was ushered in with severe winds which continued during that month. When a fire started in the grass, the wind was so strong that much larger areas than usual were burned over before help could be summoned, and consequently our troubles were increased. During that month we had reports of 1,024 fires on the whole system, a larger number than any previous March of which we have record. It came upon us so suddenly that our patrol cars were not in readiness, and undoubtedly the number of reports of fires was increased on that account; but in April, May and June the number of fires was materially decreased compared with the same months during 1914 and 1913, which was undoubtedly due in large measure to the fact that our patrol cars were in working order. The weather during the months of July, August, September, October and November was such that very few fires were reported. In July, for instance, we had only 7 reports of fires on the system; in August, only 13; in September, only 19; in October, only 20; and in November, only 78, and this was quite different from previous years.

Regardless of the weather conditions, it is our belief that owners of property along our lines are taking greater interest in fire prevention, and are endeavoring at least to do a little to keep inflammable material from their property; then, again, the prompt service rendered by the lookout men in discovering fires and summoning help is of immense value.

We have added seven patrol cars to those already in service, and hope to have our patrol service in good working order, to start in March 1 next, if necessary, to follow trains. We feel confident that this method of watching for fires is the very best, and if nothing goes wrong we hope to show a material increase in good results next year.

In addition to our regular weekly inspections of spark arresters and ash pans on our locomotives since March 1, 1915, we have requested special inspections of 564 locomotives reported as setting fires, and of this number only a few were discovered with defects which might prove troublesome. In this connection permit me to state that our motive power department is very particular to report even minor defects in inspections of these devices.

Since the 1st of last March we have secured five permissions of owners of land adjoining our property in Massachusetts to clear back a strip of land as large as possible along our right-of-way fence, and in addition we have been taking care of property for which we had permission to clear up since the department was organized in 1912. We are sure that the law which took effect Jan. 1, 1915, making operators clear the brush from the right of way for a distance of 40 feet, is showing good results; often the operators do more than clear it just this distance.

We believe that all our employees are more alert than ever before in the interest of fire prevention. We hope that you have noticed, in your travel on our lines in Massachusetts, an improvement in the condition of things around our buildings.

Of course the test of our work is best shown in a dry season, but notwithstanding weather conditions last summer, we believe our efforts are showing good results in the reduction of fires from sparks from locomotives.

Yours truly,

E. A. Ryder,
Commissioner.

Boston, Mass., Dec. 20, 1915.

Mr. M. C. Hutchins, *State Fire Warden, 6 Beacon Street, Boston, Mass.*

Dear Sir: — Complying with your request of even date, I give you below the amount paid out for cleaning up our right of way and outside of right of way for fire protection, from Jan. 1 to Nov. 11, 1915, between the following points: —

	Miles.
Buzzards Bay to Brewster,	35.06
Yarmouth to Hyannis,	3.36
Harwich to Chatham,	7.08
Tremont to Fairhaven,	19.97
Middleborough to Myricks,	7.32
Middleborough to Plymouth,	15.85

All of the above sections have been cleared, with the exception of three or four places on the Tremont to Fairhaven branch, at a cost of $4,749.90 for a total mileage of 88.64.

You understand that we have burned over all of our right of way with section men, and if you will look up your reports you will find that from Jan. 1 to Nov. 1, 1915, fires in Barnstable County were very few, and the damage slight.

Yours truly,

C. B. Rood,
General Fire Claim Agent.

Appropriation for Prevention of Forest Fires.

Appropriation for 1915,	$28,000 00
Receipts: —	
For equipment from towns and cities,	896 02
For fire towers: —	
Attleboro,	100 00
Carver,	150 00
Framingham,	100 00
Grafton,	75 00
Great Barrington,	150 00
Middleborough,	150 00
Amount carried forward,	$29,621 02

Amount brought forward,	$29,621 02	
For fire towers — *Con.*		
Norton,	50 00	
Rehoboth,	100 00	
Sudbury,	100 00	
Taunton,	100 00	
Upton,	75 00	
Wayland,	100 00	
Westborough,	100 00	
Weston,	100 00	
Westport,	150 00	
Boston & Maine Railroad,	3 35	
New York, New Haven & Hartford Railroad Company,	4 10	
Rebate on freight,	18	
Samuel Cabot, Inc.,	18 00	
Ford Motor Company,	50 00	
New England Telephone and Telegraph Company,	3 42	
M. E. Lyons,	12 00	
		$30,587 07
Expenditures: —		
Pay roll,	$15,686 40	
Traveling expenses,	5,242 56	
Stationery and postage,	178 01	
Printing,	725 64	
Equipment and supplies,	2,110 36	
Construction,	4,492 07	
Freight, express and teaming,	602 28	
Telephone,	1,440 78	
Sundries,	107 87	
		30,585 97
Balance returned to treasury,		$1 10
Reimbursement for fire-fighting apparatus to towns,		$1,806 11

Forest-fire Equipment.

Under an act of the Legislature, passed in the spring of 1910 and amended in 1914, appropriating $5,000 annually for forest-fire protection, towns with a valuation of $1,750,000 or less are entitled to 50 per cent. reimbursement on all forest-fire equipment they desire to purchase not exceeding $500, no town being allowed an amount exceeding $250. All forest-fire equipment purchased under this act is approved by this department, and placed under the supervision of the town forest warden, subject to inspection at all times by the State Fire Warden or the district forest wardens.

We have at the present time 162 towns that come within the provisions of this act. Of these, 43 have purchased equipment this year, being reimbursed $1,806.11. This equipment consists of extinguishers, pumps, shovels, rakes, wire brooms, wagons and motor trucks. Many towns, seeing the importance of getting to a fire promptly and extinguishing it in its incipiency, are purchasing motor-drawn vehicles equipped with extinguishers, pumps, etc., for this purpose. These are giving general satisfaction, and have been a great saving to many towns in not only reducing the fire loss, but have also reduced the expense of extinguishing fires very materially.

As there is an unexpended balance in this appropriation some years, it seems advisable that we ask the next General Court to amend this law, allowing the use of the balance for the purchase of forest-fire trucks equipped for handling large forest fires, and located with our district forest wardens, as we have many instances each year where we are called upon to assist in extinguishing forest fires, and at the present time we have no equipment whatever for this purpose. A portion of it could also be used to good advantage in protecting our State reservations by purchasing equipment for use on them and by making necessary fire lines.

INVENTORY OF EQUIPMENT PURCHASED UNDER THE REIMBURSEMENT ACT.

Towns.	Axes.	Cans.	Extinguishers.	Hoes.	Lanterns.	Mattocks.	Pails.	Pumps.	Rakes.	Shovels.	Wire brooms.	Wagons.	Reimbursement.
Acushnet,	1	10	18	–	–	–	4	1	–	–	–	2[1], [3]	$250 00
Ashburnham,	–	–	8	–	–	–	–	–	–	–	–	–	25 00
Ashby,	–	–	48	–	–	–	2	2	–	6	–	–	154 70
Ashfield,	–	–	33	–	–	–	–	–	–	–	–	–	99 00
Ashland,	–	24	10	–	–	–	12	8	–	6	24	–	85 78
Auburn,	–	–	83	–	–	–	–	–	–	–	–	–	249 00
Avon,	–	10	–	–	–	–	12	–	–	–	–	–	9 90
Becket,	–	14	16	–	–	–	–	2	–	–	24	–	79 50
Bedford,	1	14	24	–	–	–	–	–	–	–	–	1[2]	249 67
Belchertown,	–	–	46	–	–	–	–	1	–	–	–	1[1]	211 87
Bellingham,	–	22	23	–	–	–	6	–	–	8	–	1[1]	124 12
Berkley,	–	36	24	–	–	–	–	–	–	–	–	–	162 00
Berlin,	2	10	38	–	–	1	12	–	3	12	–	1[1]	241 45
Blandford,	6	1	16	–	–	–	3	3	–	–	12	–	83 17
Bolton,	–	14	33	–	–	–	6	–	–	6	–	–	126 65
Boxborough,	1	12	30	–	–	2	–	–	3	4	3	1[1]	182 80
Boxford,	–	–	16	–	–	–	–	–	–	–	–	–	45 60

[1] One-horse. [2] Two-horse. [3] Motor truck.

INVENTORY OF EQUIPMENT PURCHASED UNDER THE REIMBURSEMENT ACT — *Continued.*

Towns.	Axes.	Cans.	Extinguishers.	Hoes.	Lanterns.	Mattocks.	Pails.	Pumps.	Rakes.	Shovels.	Wire brooms.	Wagons.	Reimbursement.
Boylston,	–	–	66	–	–	–	24	–	–	28	–	–	$243 61
Brimfield,	–	10	36	–	–	–	–	–	–	–	–	–	119 25
Burlington,	–	–	20	–	–	–	–	–	–	–	–	–	100 00
Carlisle,	2	15	19	–	2	–	6	–	1	6	12	1[2]	250 00
Charlton,	–	–	77	–	–	–	40	–	–	60	–	–	250 00
Chatham,	2	15	11	–	2	3	4	–	3	5	–	1[1]	152 98
Chester,	–	37	15	–	–	–	–	5	–	–	12	1[1]	156 97
Chesterfield,	–	–	25	–	–	–	–	–	–	–	–	–	75 00
Cummington,	–	–	19	–	–	–	–	–	–	–	–	–	102 12
Dana,	–	–	6	–	–	–	–	–	–	–	–	1[2]	250 00
Dighton,	5	8	26	–	1	–	–	–	5	2	30	2[1]	242 89
Douglas,	–	75	50	–	–	–	–	–	–	–	–	–	180 25
Dunstable,	2	25	10	–	1	–	4	–	3	6	6	1[1]	110 69
East Longmeadow,	2	–	18	–	2	–	12	1	–	4	–	1[1]	153 96
Edgartown,	2	5	10	–	2	3	4	–	3	5	–	1[1]	152 17
Enfield,	–	20	27	–	–	–	–	–	–	–	–	–	85 87
Erving,	–	–	25	6	–	–	–	–	–	18	–	–	86 52
Essex,	–	24	12	–	–	–	–	–	–	–	–	–	37 80
Florida,	–	–	8	–	–	–	–	–	–	–	–	–	26 00
Freetown,	–	24	20	–	–	–	–	2	–	72	–	–	167 48
Georgetown,	–	54	54	–	–	–	–	–	6	12	–	–	196 48
Gill,	–	5	20	–	–	–	–	–	–	–	–	–	65 00
Goshen,	–	12	58	–	–	–	–	–	–	–	–	–	244 05
Granby,	–	12	12	–	–	–	–	–	–	–	–	–	39 90
Granville,	–	10	22	–	–	–	–	–	–	–	–	2[1]	203 50
Greenwich,	–	–	18	–	–	–	–	–	–	–	–	–	60 45
Groveland,	–	6	12	–	–	–	–	–	3	12	–	–	51 05
Hadley,	–	–	15	–	–	–	–	–	–	–	–	–	75 00
Halifax,	–	12	64	–	–	–	12	–	–	18	–	1[1]	241 91
Hampden,	–	–	24	–	–	–	24	–	6	6	6	–	89 06
Hancock,	–	9	–	–	–	–	–	2	–	–	6	–	14 37
Hanson,	–	6	24	–	–	–	6	–	–	5	–	2[1],[3]	250 00
Harvard,	2	7	29	–	2	3	–	–	3	12	–	1[2]	250 00

[1] One-horse. [2] Two-horse. [3] Motor truck.

INVENTORY OF EQUIPMENT PURCHASED UNDER THE REIMBURSEMENT ACT — *Continued.*

TOWNS.	Axes.	Cans.	Extinguishers.	Hoes.	Lanterns.	Mattocks.	Pails.	Pumps.	Rakes.	Shovels.	Wire brooms.	Wagons.	Reimbursement.
Harwich,	–	–	10	–	–	–	–	2	–	–	–	–	$48 50
Holbrook,	–	12	21	–	–	–	–	1	–	–	24	–	124 25
Holland,	–	–	8	–	–	–	–	–	–	–	–	–	25 00
Hubbardston,	–	–	52	–	–	–	18	–	–	4	–	–	175 75
Kingston,	–	–	24	–	–	–	–	–	–	–	–	2[1]	108 00
Lanesborough,	2	5	–	–	3	–	–	3	6	6	48	1[1]	97 25
Leverett,	2	20	16	8	2	4	–	2	4	8	–	2[1]	160 17
Littleton,	–	–	6	–	–	–	–	–	–	18	–	–	34 87
Leyden,	16	10	10	17	–	–	–	–	4	8	–	–	31 55
Lunenburg,	2	36	10	–	2	3	4	–	3	29	–	1[1]	160 37
Lynnfield,	–	35	20	–	–	–	–	10	–	–	6	2[1]	249 95
Mashpee,	6	24	25	–	–	–	12	–	–	12	–	1[1]	157 12
Mendon,	–	24	21	–	–	–	–	–	–	–	42	1[1]	173 97
Merrimac,	–	–	15	–	–	–	–	–	–	–	–	–	75 00
Middleton,	–	12	16	6	2	–	–	–	–	5	–	–	157 69
Millis,	–	–	8	–	–	–	–	–	–	–	–	1[2]	242 00
Monterey,	–	–	–	–	–	–	–	3	–	–	12	–	15 25
New Ashford,	–	–	–	–	–	–	–	4	–	–	4	–	18 25
New Braintree,	–	–	37	–	–	–	–	–	–	–	–	–	120 97
New Salem,	–	55	20	–	–	–	–	–	–	–	–	–	100 50
Newbury,	–	–	6	–	–	–	–	8	–	–	12	–	55 90
Norfolk,	–	–	18	–	–	–	–	–	–	–	–	–	99 00
North Reading,	–	–	38	–	–	–	–	–	–	–	–	1[1]	248 43
Northborough,	–	–	25	–	–	–	–	–	–	–	–	–	102 37
Norwell,	6	–	32	–	–	–	12	–	–	12	–	1[1]	250 00
Oakham,	–	12	31	–	1	1	6	–	3	3	–	1[1]	226 97
Otis,	–	5	10	–	–	–	–	–	–	–	–	–	62 50
Paxton,	3	–	28	12	–	–	–	–	–	6	–	–	105 87
Pelham,	–	–	19	–	–	–	–	5	–	–	–	–	84 12
Pembroke,	–	–	31	–	–	–	60	–	–	–	–	1[2]	250 00
Petersham,	2	10	36	–	2	3	4	–	3	5	–	1[1]	248 05
Phillipston,	–	36	38	–	–	–	–	1	–	–	–	–	130 15
Plainfield,	–	–	15	–	–	–	–	–	–	–	–	–	82 50

[1] One-horse. [2] Two-horse.

INVENTORY OF EQUIPMENT PURCHASED UNDER THE REIMBURSEMENT ACT — *Continued.*

Towns.	Axes.	Cans.	Extinguishers.	Hoes.	Lanterns.	Mattocks.	Pails.	Pumps.	Rakes.	Shovels.	Wire brooms.	Wagons.	Reimbursement.
Plainville,	2	10	22	–	2	3	4	–	3	5	18	1[1]	$225 00
Plympton,	–	–	–	–	–	–	–	12	–	–	–	–	20 93
Prescott,	–	100	10	–	–	–	–	–	–	–	–	–	58 03
Princeton,	–	32	80	–	–	–	–	–	–	–	–	–	249 20
Raynham,	3	46	30	–	6	3	12	–	9	15	–	3[1]	222 23
Rehoboth,	–	10	48	–	–	–	–	–	–	–	–	1[1]	250 00
Richmond,	–	15	31	–	–	–	4	–	–	12	–	–	109 20
Rochester,	–	24	60	–	–	–	–	–	–	30	–	–	205 37
Royalston,	3	20	32	30	2	2	12	–	–	42	–	2[1]	250 00
Russell,	–	7	39	–	–	–	–	–	–	–	–	1[1]	220 25
Rutland,	–	12	18	–	–	–	6	–	–	–	–	1[2]	250 00
Salisbury,	3	–	27	–	6	–	24	–	–	6	–	–	140 87
Sandwich,	22	12	36	–	–	2	–	–	–	24	–	1[1]	245 60
Shelburne,	–	–	50	–	–	–	–	–	12	6	–	1[1]	186 87
Shirley,	–	48	36	–	–	–	–	–	–	–	–	–	139 50
Shutesbury,	–	28	25	–	–	–	23	–	–	6	–	–	101 25
Southampton,	–	–	–	–	–	–	–	1	–	–	12	–	8 75
Southwick,	–	12	26	–	–	–	–	–	–	–	–	1[1]	101 50
Sterling,	–	–	25	–	–	–	–	–	–	–	18	1[2]	241 12
Stow,	–	–	42	–	–	–	–	–	–	18	–	–	131 31
Sturbridge,	–	11	35	–	–	–	–	–	–	–	–	–	116 45
Sudbury,	–	–	40	–	–	–	–	–	–	–	–	–	250 00
Sutton,	–	50	50	24	–	–	–	–	32	24	–	–	188 46
Tewksbury,	2	–	24	–	2	–	–	–	–	30	–	1[1]	174 00
Tolland,	–	–	–	–	–	–	–	4	–	–	4	–	18 26
Townsend,	–	–	46	–	–	–	–	–	–	–	–	–	250 00
Tyngsborough,	–	220	20	–	–	–	–	54	12	24	36	–	250 00
Tyringham,	2	10	30	–	2	–	10	–	2	3	–	1[2]	144 80
Upton,	–	–	30	–	–	–	–	–	–	–	12	1[1]	235 28
Wales,	2	–	40	12	2	2	2	–	–	6	–	1[1]	241 99
Warwick,	–	6	10	–	–	–	–	–	–	–	–	1[1]	154 35
Washington,	–	–	15	3	1	–	10	–	–	8	–	1[1]	105 32
Wendell,	–	38	27	–	2	–	12	–	–	18	–	1[1]	163 24

[1] One-horse. [2] Two-horse. [3] Motor truck.

INVENTORY OF EQUIPMENT PURCHASED UNDER THE REIMBURSEMENT ACT — *Concluded.*

Towns.	Axes.	Cans.	Extinguishers.	Hoes.	Lanterns.	Mattocks.	Pails.	Pumps.	Rakes.	Shovels.	Wire brooms.	Wagons.	Reimbursement.
West Boylston,	–	–	107	–	–	–	–	–	–	–	–	–	$250 00
West Bridgewater,	–	–	20	–	–	–	–	–	–	–	–	1[1]	250 00
West Brookfield,	–	12	37	–	–	–	–	–	–	–	–	–	121 75
West Newbury,	–	8	13	–	–	–	–	3	–	–	18	–	87 12
Westhampton,	–	–	16	–	–	–	–	–	–	–	–	–	48 00
Westminster,	–	77	48	24	–	–	24	–	–	24	–	–	244 09
Wilbraham,	–	27	32	–	–	–	23	–	12	6	–	–	118 38
Wilmington,	–	12	40	–	1	–	–	18	–	34	–	–	187 38
Windsor,	–	–	40	–	–	–	–	–	–	–	–	–	200 00
Worthington,	2	15	10	–	–	3	–	–	–	5	–	1[1]	86 01
Wrentham,	–	12	30	–	–	4	–	–	–	–	–	1[1]	250 00
Totals,	108	1,728	2,361	142	50	42	475	158	144	775	401	61	$18,818 67

[1] One-horse.

TOWNS RECEIVING FIRE-EQUIPMENT REIMBURSEMENT DURING YEAR 1915.

Ashby,	$39 00	Leyden,	$9 20
Ashland,	7 87	Littleton,	34 87
Belchertown,	36 00	Mashpee,	32 32
Bellingham,	1 20	Mendon,	3 75
Blandford,	23 37	Middleton,	108 19
Bolton,	19 50	Monterey,	15 25
Brimfield,	19 50	New Ashford,	18 25
Carlisle,	2 28	Oakham,	4 00
Chester,	59 95	Plainfield,	82 50
Cummington,	37 62	Prescott,	9 87
Dana,	231 25	Richmond,	23 00
Dighton,	125 10	Royalston,	104 90
Douglas,	5 25	Salisbury,	102 00
Dunstable,	4 55	Shutesbury,	13 75
Enfield,	84 37	Southampton,	8 75
Georgetown,	2 40	Tyringham,	32 50
Granville,	73 50	Wales,	5 22
Hampden,	50 06	Washington,	18 40
Hancock,	14 37	West Bridgewater,	49 88
Harwich,	40 00	West Newbury,	18 37
Holbrook,	55 25		
Kingston,	108 00	Total,	$1,806 11
Lanesborough,	70 75		

Federal Co-operation.

The co-operative work carried on between this State and the Federal department has been very satisfactory. We were allowed $2,500 from the Weeks law fund for the protection of the watersheds within the State. This was expended in payment of the observers throughout the State, covering a period of ten weeks. I anticipate that this appropriation will be increased next year, owing to the cost of maintaining the co-operative observation towers established along the State boundary lines.

Each forest warden was furnished with a supply of cloth fire-warning notices, giving extracts from the forest-fire laws. These were posted in conspicuous places in each town, 10,000 copies being used throughout the State.

In conclusion I desire to say that the loyalty and enthusiastic co-operation of all the employees of this branch of the department during the past season is heartily appreciated.

Respectfully submitted,

M. C. Hutchins,
State Fire Warden.

The Brown-tail Moth Situation.

The brown-tail moths have been far less in evidence throughout the State the past year than during any year since they became a pest here. No one condition is to be held responsible for this state of affairs, probably, but a fortunate combination of occurrences. The fungous disease of the brown-tail larva has been one of the very effective agents in lessening the numbers of this insect. This disease has recurred each year in nature, and where it appears sweeps the moths off almost to annihilation. During two seasons we were able to produce the disease artificially in the laboratory, and thereafter it was methodically placed in every badly infested section of the State with pronounced success. The two years succeeding, however, we were unable, for some unaccountable reason, to reproduce our previous results, although at greater pains and expense. These same seasons, however, we found the disease reproducing itself in nature and equally effective.

Undoubtedly, the imported parasites have very materially aided the situation in destroying a goodly percentage of these insects.

Late summer and early fall spraying have been practiced

with very beneficial results in some of our worst infested divisions.

During the past summer the flight of the brown-tails was so slight as to be scarcely noticed in many cities and towns, — a great contrast to the flight of previous years, when it was almost an imitation of a snowstorm in summer, so thick were they about the electric lights. It is altogether too early for us to prophesy as to the future of this moth pest, but let us hope that whatever the cause of the reduction in numbers is, it will continue its good work.

The splendid results of moth-forestry work about our inland lakes and streams, where the white oaks in particular were thinned out and then the remaining trees sprayed, have been the means of making the cottages, heretofore deserted owing to this irritating insect, again habitable.

Use of Burlap discarded.

Burlapping trees for the gypsy moth, which a few years ago was in common use, such quantities being used that it was purchased by the carload, has practically been discarded as an economic method in moth control. A bale or two constituted our entire purchase the past season. The burlap bands over trees were never intended to furnish anything other than a place for the larvæ, or worms, to crawl under as a protection. Taking advantage of this natural habit these bands were so attached that they could be turned up and the insects destroyed. While the burlap was not in itself very expensive, the work of inspecting during the season was burdensome. The bands were sometimes put on and then never turned, in which case they protected rather than hindered the development of the insects.

It was found that the same amount of expense put into spraying with arsenate of lead was more effective and more sure of results.

Burlap may still be used effectively in a newly infested section like the western part of the State, but even here tanglefoot would perhaps be better. For the badly infested section of the State, however, it is not advised, and has been discarded generally as being impracticable.

Large High-power Sprayers.

The gigantic undertaking under the direction of this office, which involves the saving of the foliage on hundreds of miles of streets, public thoroughfares, parks, woodlands and estates throughout eastern Massachusetts, requires not only modern high-power sprayers of the latest design, but thorough and efficient planning to accomplish results. The spraying season lasts but about six weeks, and rainy weather, poor spraying material, broken-down machinery, labor troubles and drought or lack of water are a few of the difficulties that it may be necessary to surmount during any spraying season.

A few years ago most of the spraying equipment was made of cast-iron construction, but now the more important bearings and parts are made of metals guaranteed to withstand wear.

Towns and cities with tall and handsome shade trees that they care to preserve need, by all means, to own one or more modern high-power sprayers.

The large high-power sprayer originally perfected and brought into use by the State Forester's department is the standard machine still in use.

This department continues to build its own machines of this character, although they are assembled for us at a price less than it cost us when it was done by our own mechanics. The State does not sell these machines; they are simply used in our co-operative work with towns and cities under the moth law.

Small Power Sprayers.

Several makes of small power sprayers are on the market at the present time which are proving very valuable for certain kinds of spraying. It is a mistake, however, to entertain the idea for a moment that these small machines can perform the function of the modern high-power sprayer.

A few years ago there were but two units in spraying, — the large sprayer and the hand-pump barrel outfit. The latter was used by the local moth superintendent as an auxiliary in his work, and where it was impossible to meet the demands for spraying on estates and in badly infested places with the

large machine, a crew of two or three men with a barrel pump could be put to work independently. As a matter of fact, many towns depended entirely upon this type of spraying alone.

The question of efficient labor and the scarcity of it began to make spraying by hand expensive; also farmers and fruit growers even found hand spraying too laborious and expensive a proposition, and they are gradually turning to the small-power outfits which are very popular and practical. A 1½ to 2 horse-power machine saves the manual labor of pumping. Much time is saved, as the engine does not stop for rest. These machines are easily transported, economical of the spraying solution, within the means of any average farmer or fruit grower, economical of labor, and can be used even in spraying the larger trees by climbing. They throw a very fine mist spray from which satisfactory results are obtained. A farmer can spray his fruit trees independently and at the psychological moment if he has one of these outfits.

These same sprayers are being used more or less also by towns and cities. Many moth superintendents do practically all of the private work in their towns, and while their larger machines are busy spraying, a great amount of work that is self-supporting, so-called rush orders, can be attended to by these small auxiliaries.

A small 4 horse-power sprayer was placed upon the market last year that has apparent merit, particularly where the trees are not tall, as in many Cape Cod towns. This machine is modeled after the high-power State machine, and from last year's experience with it, is to be recommended.

The Auto Truck in State Forestry Work.

This department built an auto-truck sprayer for use in the North Shore moth work, and it has been in constant demand since. The first cost seemed great, but the fact that with this machine a large portion of the highways have been sprayed over the North Shore, thereby saving the expense of many more horse-drawn machines, makes it at once apparent that the final cost is not excessive. This power machine saves a great amount of time over a horse-drawn sprayer in that when once emptied it can quickly be replenished from the water

A pasture at Chelmsford that should be reforested.

A young plantation of white pine on similar land as above, at Royalston. Ideal white pine land.

supply. The saving is not only one of horse hire, but of labor, as the same number of men can cover a far greater territory with the truck. It is believed that our State highways could be handled more economically and with more satisfactory results were we to provide auto-truck spraying outfits for the work.

These sprayers are so constructed that the tank and pump which are made in one piece can be detached and then the truck may be used as a regular auto truck. We use our present truck throughout the remainder of the year for every kind of work. It has occurred to the writer that with a little further adaptation these same trucks may be used for an auxiliary forest-fire equipment. It has been thought that eventually we may have an auto truck in each district of the State where it could be used for spraying during the season, and then as a forest-fire reserve equipment for the remainder of the year. This extra equipment is just the thing needed in many rural sections, particularly when the local apparatus is not very pretentious. This equipment could cover territory with a large radius, and would prove very effective.

Besides the State Forester's auto-truck sprayer outfit, similar equipment has been purchased by the State Water and Sewerage Board and the town of Canton; also the United States Department of Agriculture is building an outfit for the Bureau of Entomology for use in New England on the moth work.

Parasite Work.

The following report was kindly furnished by Dr. L. O. Howard, chief of the Bureau of Entomology, upon request for a comprehensive statement of the present condition of this work. His correspondence is published in full, as it gives just the information desired.

Washington, D. C., Dec. 1, 1915.

Dear Professor Rane: — In accordance with your request and with my annual custom I am writing you concerning the condition of the parasites of the gypsy moth and brown-tail moth which have been imported into New England by this Bureau in co-operation with the State of Massachusetts and other official organizations and individuals in foreign countries and at home.

The statement which is enclosed, and which I trust you will have printed in quotation marks, has been drawn up by Mr. A. F. Burgess of this Bureau, in charge of our work against the gypsy moth and brown-tail moth. It will be noted in the opening paragraph that during the year no parasites have been introduced from abroad. This has been largely due to war conditions in Europe. So soon as matters become settled over there it is my hope to send one or more expert assistants to certain countries in the effort to rear and to introduce into the United States certain additional parasites which we know to exist, and some of which have already been imported but have not become established in this country. A study of the notes made at the laboratory at Melrose Highlands, Mass., indicates that some 29 species of the natural enemies of the gypsy moth and brown-tail moth have been imported from time to time, and that 12 of these species have been established. The establishment of the remaining 17 has either failed or is doubtful. There remains a possibility that some of them may be recovered at a later date, but this is entirely problematical. Of the 12 which have become established, at least 7 seem to have been doing very efficient work during the past year, as will appear from Mr. Burgess's more detailed statement.

Mr. Burgess has mentioned in his report the destruction of a certain percentage of the Calosoma beetles by skunks and other agencies. The striking appearance of this beetle renders it easily recognizable, and it is feared that in its increasing abundance it may be heedlessly destroyed by ignorant people or largely collected by ardent and unscrupulous collectors. The Bureau has, therefore, as you know, issued a series of posters and cards calling attention to this and other important enemies of the gypsy moth and the brown-tail moth, in order to prevent this destruction in some measure at least. It seems to me especially desirable that the Boy Scouts of New England should be able to recognize these beneficial insects, in order that this information may be carried into the homes in general. Is it not possible, also, that the Boy Scouts might be utilized in some way in the warfare against these two species of injurious insects?

Yours very truly,

L. O. Howard,
Chief of Bureau.

Statement of Mr. A. F. Burgess.

During the year 1915 no parasites of the gypsy moth nor the brown-tail moth have been introduced from abroad, and conditions have been such that it has been impracticable to attempt to carry on observations on these insects in their native home, or to collect material there for study or investigation. The summer of 1915 was unusually cool, and precipitation was heavier than has been recorded for many years. These two factors, namely, temperature and humidity, have undoubtedly had their effect on reducing the activity of parasites as well as curtailing the rapid development of the wilt disease, which is a prominent factor in reducing gypsy moth infestations.

An attempt has been made during the year 1915 to liberate colonies of parasites in as much of the infested territory as possible outside of the area where these beneficial species were known to exist. During the spring extensive work was carried on with *Anastatus bifasciatus*, one of the egg parasites of the gypsy moth. From a colony of this insect which was liberated a number of years ago near West Peabody, Mass., it was possible to collect large numbers of parasitized gypsy moth eggs. Between 9,000,000 and 10,000,000 of parasitized eggs were obtained in this region, and colonies were liberated in Maine, New Hampshire and Vermont. In all, 91 towns were colonized, 65 of which were in Massachusetts. The species is now quite well distributed in Massachusetts, but further colonizations will be necessary, particularly in the southern part of the State. It is hoped that enough parasites may be secured this winter so that the remaining towns which are badly infested with the gypsy moth can be colonized during the spring of 1916.

The other parasite which attacks gypsy moth eggs, namely, *Schedius kuvanae*, has been colonized during the last part of the present year in many towns in Massachusetts, particularly in the southern part of the State. At the present time colonies have been liberated in nearly all the towns where infestation is at all severe.

During the winter of 1914-15 collections of brown-tail webs secured from certain localities showed quite heavy mortality of the caterpillars in the webs. The number was not as great as during the previous year and in some sections mortality was extremely low. *Apanteles lacteicolor*, one of the parasites of this caterpillar, was found more abundantly than during the spring of 1914. This parasite seems to be increasing in number at present, after suffering a severe decrease last year. *Meteorus versicolor* is also increasing, and has been found in sections, many miles from points where colonies have been liberated. These two species have already spread into nearly every town in Massachusetts which is infested by the gypsy moth and the brown-tail moth, so that further colonization is not deemed necessary at present.

Another species of *Apanteles*, which is known as *Apanteles melanoscelus*, and which is a parasite of the gypsy-moth caterpillars, is increasing in the region around Melrose, where it was originally liberated. It was possible to collect enough specimens so that three colonies of 500 each were liberated this year. One was placed in Manchester, N. H., and the others at Middleborough and Harwich, Mass.

Compsilura concinnata has been abundant in some localities, but does not seem to be generally distributed over the territory, although it has been found during different years in nearly every infested section. It is interesting to know that several species of Tachinid parasites, which have heretofore simply maintained themselves without increasing to any great extent, have been recovered in greater numbers than ever this year, and in some cases they have been obtained many miles from the nearest colony that was liberated. This refers particularly to *Blepharipa scutellata*, a parasite of the gypsy moth, and to *Zygobothria nidicola*, which attacks the brown-tail moth.

The Calosoma beetle (*Calosoma sycophanta*) has been slightly more abundant this year than heretofore. Its activities have not been quite as noticeable in all cases on account of the cool weather, which had a tendency to keep the beetles in seclusion. In some areas heavy mortality among the beetles has been caused by skunks and possibly by other animals. This species has, however, maintained its good reputation as a foe of the gypsy moth.

Considering the gypsy moth infested region as a whole, there has been no decrease in the severity of infestation during the past year. As stated at the outset, the weather conditions have been unfavorable for the work of the natural enemies, and on the average, a slight increase in infestation is noticeable in many sections. Under normal conditions the effect of natural enemies will probably be more pronounced. In the case of the brown-tail moth, the infestation has been enormously reduced during the last two years. This has been brought about by several agencies, but the parasites and natural enemies have undoubtedly contributed materially.

Gypsy Moths and Cranberry Bogs.

Perhaps the most serious new development in connection with the gypsy moth work is the invasion by these insects of the cranberry bogs. As the Cape country began to have a general infestation, reports were received indicating that they were here and there found upon cranberry bogs, but no great damage to this property from their invasion was felt until the past two seasons, particularly the last year. Cranberry growers as a whole are very businesslike, and as soon as the larvæ were found eating the cranberry vines spraying was begun and other remedial measures were taken. However, the past season's experience has demonstrated that the conditions have become so serious that the vast cranberry industry, which is of such great economic importance, has become actually threatened and demands our immediate attention. The fact that these insects readily prey upon the cranberry vines complicates the situation and brings an altogether new problem up for solution.

The State Forester has had two meetings with representatives of the Cape Cod Cranberry Association, and through his division men has been able to make a very general survey of the present conditions and the problem confronting us. The cranberry business is found to be the fundamental industry of many Cape towns, approaching as high as seven-eighths of

the assessed valuation in one town. After a close study of conditions it is believed that our present moth law contains all the elasticity necessary for dealing with the emergency, provided we have sufficient additional funds to cope with the situation.

At the present time a careful survey of the situation is being made in each of the towns, and definite estimates of the cost of doing the work are being accumulated. It is our purpose to call a public meeting at some central point like Middleborough at an early date, at which time the whole subject may be gone into and discussed in detail by those interested. Whether the matter will demand special legislation or consideration at the hands of the General Court remains to be seen. That the problem is a serious one there is no question.

Special Co-operative Moth Work.

Under this heading we include the work done on the North Shore in co-operation with the city of Beverly and town of Manchester and the residents of that section, the work done in Dover woodland in co-operation with the town and the property owners of Dover, and a new undertaking, under the name of the Sagamore Beach gypsy moth work, which we have undertaken during the last year in co-operation with the Sagamore Beach Association and property owners in that vicinity.

The North Shore work has been continued during the past year along the same general lines as in previous years, and the work has been handled in an able and efficient manner by our division superintendent, Mr. Phillips, and his assistant, Mr. Donovan. The chairman of the committee, Col. Wm. D. Sohier, expresses himself as being much pleased with the work this year. The expense of the work has been much lessened this last year owing to the fact that no thorough winter work was done in the woodland. This has resulted in the gypsy moths increasing in certain small areas, and it will be necessary to do some creosoting this year in order to prevent the spread. During the last year 2,928 acres were sprayed at an average cost of $5.63 per acre; 524 acres were cut and burned

over at an average cost of $9.70 per acre; 2,630 acres were creosoted at an average cost of $1.19 per acre. The cost of this cutting and burning was very low, owing to the fact that a large amount of work was done by the so-called "unemployed" under the relief fund, which was organized last winter.

In Dover the work has progressed along the same lines as those laid down in the beginning for the work. Spraying was done during the season, the cost of which was partly paid by the owners. Much thinning has been done and the wood sold and the proceeds turned in to the fund for future work.

The work at Sagamore Beach has not been of great extent, but has been of great benefit to the summer colony there and has been largely self-supporting.

Special North Shore Fund.

Balance from 1914,	$8,330 70	
Receipts: —		
William Morris,	30 38	
City of Beverly,	3,000 00	
Wm. D. Sohier, agent for property owners,	5,977 21	
Town of Manchester,	3,500 00	
Wm. D. Sohier, agent,	5,000 00	
F. W. Rane, State Forester,	4,113 48	
Massachusetts Highway Commission,	46 56	
Appropriation for suppression of gypsy and brown-tail moths,	2,633 19	
Massachusetts Highway Commission,	120 43	
Boston & Maine Railroad,	12 75	
		$32,764 70
Expenditures: —		
Pay roll,	$13,750 17	
Travel,	1,992 97	
Supplies,	8,396 37	
Rent,	317 50	
Stationery and postage,	25 85	
Sundries, including teaming, telephone, etc.,	1,471 54	
		25,954 40
Balance Nov. 30, 1915,		$6,810 30

Dover Gypsy Moth Fund.

Balance on hand Nov. 30, 1914,	$1,061 82	
Receipts: —		
F. W. Rane, State Forester,	1,000 00	
For tools lost,	1 00	
Property owners, and wood sold,	2,338 69	
		$4,401 51
Expenditures: —		
Pay roll,	$3,737 22	
Supplies,	455 51	
Teaming,	5 00	
Maps,	4 50	
Stationery (time books),	98	
		4,203 21
Balance Nov. 30, 1915,		$198 30

Special South Shore Fund.

Balance from 1913,		$66 19
Expenditures: —		
Supplies (arsenate of lead),	$64 80	
Stationery and postage,	1 39	
		66 19
Balance Nov. 30, 1915,		-

Sagamore Beach Gypsy Moth Fund.

Receipts: —		
E. W. Souther, agent,	$799 00	
F. W. Rane, State Forester,	500 00	
Various owners, for cordwood,	198 25	
		$1,497 25
Expenditures: —		
Pay roll,	$806 27	
Travel,	2 89	
Supplies,	69 90	
Teaming, etc.,	97 90	
Seedlings,	40 50	
		1,017 56
Balance Nov. 30, 1915,		$479 69

Reports on Moth Work from Cities and Towns.

Data from the whole moth-infested section of the State in the form of reports from each city and town are on file in the office. It has been our policy to print this information in the annual report every second or third year, and this would be the season for doing so, but as the report is already large it will necessitate its being deferred.

The following reports from the city of Boston and the town of Brookline are examples of these reports: —

Boston, Dec. 23, 1915.

Dear Sir: — In accordance with your request I herewith submit following report on moth-suppression work for city of Boston during the year 1915. We expended almost $45,000, of which amount $18,000 was laid out on private estates, and the balance, $27,000, on public work and excess liability on private work.

The general condition of the city is excellent, there being only a very light infestation of brown-tails in West Roxbury and Hyde Park sections, with a general infestation of the gypsy.

Conditions in Charlestown, East Boston, South Boston and city proper are very satisfactory, with an isolated infestation of gypsy.

Jamaica Plain, Brighton and Dorchester have a general infestation of gypsy, about 90 per cent. less than in 1910.

With our increased facilities for spraying we have been able the past two years to cover entire city; no defoliation of any kind noticed or reported. We have at present twelve Fitz-Henry high-power sprayers and one auto-truck sprayer; also four hand tubs and three Church machines to help out in case of necessity.

Our park system is in splendid condition, a great part of it being uninfested.

During the coming year we intend to cover the entire city with destruction and spray work.

Too much credit cannot be given to the State Forester's office for the courtesy and assistance rendered to me in the course of my efforts to do this work as thoroughly as possible during past years.

Very truly yours,

William P. Long,
Superintendent of Street Trees and Moth Work.

Brookline, Dec. 22, 1915.

The following is a report of the moth work done in Brookline for the year ending Dec. 31, 1915.

The appropriation for the suppression of gypsy and brown-tail moths was $28,450.

Last winter all the trees in the town were creosoted, and this past spring the 4,500 acres comprising the town's area were sprayed. Of this amount about 1,200 acres are woodland. The infestation of gypsy moths this fall is about 50 per cent. less than last year, and the situation can easily be controlled with an appropriation smaller for gypsy moths than last year. The flight of brown-tails was slightly larger than a year ago. These nests will be removed during January and February.

The town appropriated the sum of $3,000 for leopard moth work. This insect is on the increase, and is by far the most serious problem the department will have to contend with in the way of tree pests for the next few years.

The patrolling of our woodland area in the dry seasons during the spring and fall reduced the number of fires from 32 in 1914 to 7 in 1915.

The department is also trying to encourage nesting of useful birds in the town. We have placed this year 350 bird houses of various designs in roadside trees throughout the town. During the coming winter we will keep the 53 feeding stations for the birds well stocked with proper grains, etc. As yet no appreciable number of the boxes have been occupied. We hope that it will be possible to give you excellent reports on this division of the department's work during the next year.

I take this opportunity to thank you and your office for the many courtesies extended to the town during the years I have been connected with this department.

Daniel G. Lacy,
Superintendent.

The Purchase and Distribution of Supplies.

Some time during the month of December concerns handling the various supplies which we use in our work are asked to submit bids on such quantities as we may need for the ensuing year.

The successful bidder accepts our requisitions from time to time for such quantities as may be called for by the cities and towns entitled to supplies through this department, also for supplies for the nurseries and for the special reforestation work being carried on by us. When a city or town is in need of any supplies the local superintendent makes out his list, using a catalogue of supplies and shipping order furnished him by this office.

He hands this shipping order to the field superintendent, who lays out and supervises the work being done in each city and town, and knows just what supplies are needed, and therefore is held responsible for the approval of these shipping orders.

The field superintendent in turn mails the order to this office, where the requisitions are made out on the concerns from whom we purchase the supplies.

Orders for supplies for nursery or reforestation work must be approved by the assistant State forester in charge of that particular line of work.

We endeavor at all times to furnish supplies of a good grade.

The following is a list of cities and towns, with amount of supplies for moth work furnished them, for the year ending Nov. 30, 1915. The amounts given are the gross amounts furnished, some of the cities and towns having made payments to the State Forester's office for all or a part of the amounts, according to the amount of their net expenditures or their class under the provisions of the law. For amounts received from this office in reimbursement and supplies see the table on page 98.

List of Towns and Amounts of Supplies furnished for 1915.

Third-class Towns.

Acton,	$574 77	Georgetown,	$478 16
Ashburnham,	341 88	Grafton,	1 08
Ashby,	264 74	Groton,	503 71
Ashland,	138 45	Groveland,	192 97
Auburn,	47 30	Halifax,	6 45
Avon,	81 89	Hanover,	432 79
Ayer,	285 60	Hanson,	148 87
Bedford,	785 90	Harvard,	1,015 11
Belchertown,	13 85	Holden,	175 08
Berkley,	16 52	Hopkinton,	65 90
Berlin,	358 99	Hudson,	526 35
Billerica,	784 13	Ipswich,	764 81
Bolton,	590 63	Kingston,	262 64
Boxborough,	595 20	Lakeville,	79 00
Boxford,	419 29	Lincoln,	1,446 44
Boylston,	108 69	Littleton,	465 27
Bridgewater,	53 71	Lunenburg,	606 72
Burlington,	477 79	Lynnfield,	529 13
Carlisle,	430 94	Marshfield,	152 53
Carver,	[1] 2,630 03	Mashpee,	437 85
Chelmsford,	733 19	Merrimac,	211 99
Dracut,	734 64	Middleborough,	1,075 64
Dunstable,	192 53	Middleton,	227 22
Duxbury,	252 27	Millbury,	1 08
Edgartown,	1 45	Newbury,	665 87
Essex,	40 17	Norfolk,	89 64

[1] Includes large power sprayer.

Third-class Towns — Con.

North Andover,	$677 07	Stoneham,	$881 32
North Reading,	820 06	Stoughton,	231 57
Northborough,	429 91	Stowe,	677 21
Northbridge,	1 08	Sudbury,	791 36
Norwell,	657 69	Templeton,	122 93
Orange,	1 80	Tewksbury,	709 32
Orleans,	40	Topsfield,	230 06
Oxford,	1 08	Townsend,	350 01
Pembroke,	549 98	Truro,	147 54
Pepperell,	572 47	Tyngsborough,	757 90
Plainville,	43 34	Upton,	1 08
Plympton,	225 49	Uxbridge,	1 08
Princeton,	387 33	Wayland,	1,010 23
Raynham,	160 62	Wenham,	705 21
Rockland,	[1] 1,731 13	West Boylston,	[2] 668 96
Rowley,	525 37	West Bridgewater,	402 45
Salisbury,	488 32	West Newbury,	[1] 1,578 55
Sandwich,	381 94	Westborough,	189 17
Scituate,	895 42	Westford,	914 07
Sherborn,	372 25	Westminster,	105 41
Shirley,	298 26	Wilmington,	871 13
Shrewsbury,	98 30	Winchendon,	331 69
Southborough,	375 33		
Sterling,	326 75		$43,216 49

First and Second Class Towns.

Andover,	$755 03	Methuen,	$929 23
Barnstable,	[1] 2,862 88	Natick,	36 29
Canton,	1,468 66	Newton,	4,372 97
Concord,	528 23	Reading,	1,418 15
Danvers,	752 16	Saugus,	592 89
Fall River,	92 30	Wakefield,	456 63
Gloucester,	558 84	Waltham,	[1] 2,614 62
Hamilton,	519 88	Weston,	1,862 87
Lexington,	1,310 21	Woburn,	219 29
Lowell,	387 41	Worcester,	1,453 86
Marlborough,	803 13		
Medford,	269 70		$24,265 23

[1] Includes large power sprayer.

[2] Includes small sprayer.

Automobiles,	$78 60
Division superintendent (moth),	312 55
Dover gypsy moth fund,	427 96
Forest thinnings,	253 11
Grafton State Hospital,	5 63
Prevention of forest fires,	684 63
Purchase and planting of forest lands,	41 03
Relief fund for unemployed,	1,055 88

Sagamore Beach gypsy moth fund,	$44 05
Special North Shore fund,	5,644 76
State Forest Commission,	66
State Forester's expenses,	135 06
Supply store,	173 86
Traveling sprayers, etc.,	1,428 58
Total,	$10,286 36

Housing of Equipment.

During the past ten years the work of preserving our trees and forests from destruction by insects and forest fires has caused the cities and towns in our State to purchase more or less equipment for use in this work.

This equipment consists of spraying machinery, forest-fire wagons and all of the minor tools and equipment that go with them, such as fire extinguishers, axes, shovels, water cans, acid and soda, spraying hose, creosote brushes and many other tools of minor importance but essential to the work. Up to the present time the care of this equipment has not been what it should be in a number of cities and towns.

The State's policy has been to be generous and give as much aid as possible where it is of public concern. Both the moth law and the forest-fire equipment law encourage cities and towns in acquiring this equipment, as a part of the expense of it is shared by the State under certain conditions.

When a modern high-power sprayer has been purchased which has cost the town and State each $600, its future value is greatly prolonged if it is properly housed and taken care of. What is true of the sprayer is true of other tools. We have gathered the data as to the methods practiced generally, and there is a great lack of uniformity.

Many municipalities have given the subject attention and either built new buildings or have remodeled and adapted old buildings for their use at small expense. Others have their town property scattered all over the town, and often are paying more rent than it would cost to properly house the equipment in a convenient central place. Nearly every town or city has headquarters for its road and other equipment. This is the natural center, where a neat shed could be constructed for the sprayers and fire wagon, and, by extending its length

15 or 20 feet, a workroom and storeroom might be added where, under lock and key, the equipment would always be safe and constantly ready for use.

A building of this kind serves to systematize the work, as a note left here will give the information as to where the official in charge can be found. On rainy days and at other times there are many things that can be attended to at these headquarters, like repairing of equipment, making out reports, painting, making an inventory of the work, etc., which otherwise would be more or less neglected.

We mention this matter here, particularly to call it to the attention of the towns and cities that should be especially interested in the housing of their equipment.

The State Forester insists that his division men personally see that all spraying machines and forest-fire equipment be put in order so as not to freeze before cold weather, etc., but as pointed out above, there is an opportunity to improve conditions in many places, and it is believed that the matter should receive the consideration of our public-spirited citizens, and be called to the attention of the authorities.

State Highway Work.

Along the State highways spraying and cleaning for the gypsy and brown-tail moths and elm-leaf beetle were done under the direction of this department. Bills for this work were approved by us and transmitted to the State highway department for payment. The list of towns and cities in which the work was done is as follows: —

Work on State Highways, 1915.

Acton,	$202 00	Ayer,	$25 25
Agawam,	28 50	Barnstable,	65 84
Amesbury,	32 74	Barre,	49 35
Amherst,	25 00	Bedford,	43 46
Andover,	61 35	Bellingham,	10 20
Ashburnham,	95 25	Beverly,	166 99
Ashby,	43 50	Billerica,	77 15
Ashland,	68 88	Bourne,	155 00
Athol,	24 50	Boxborough,	165 90
Auburn,	29 70	Braintree,	20 00

WORK ON STATE HIGHWAYS, 1915 — *Continued.*

Brewster,	$182 25	Lunenburg,	$83 85
Bridgewater,	21 42	Marion,	14 00
Brookfield,	61 22	Marlborough,	202 20
Burlington,	108 87	Marshfield,	71 21
Canton,	23 50	Mashpee,	21 41
Charlton,	20 36	Melrose,	15 40
Chatham,	8 65	Merrimac,	33 17
Chelmsford,	94 35	Methuen,	64 60
Chester,	34 25	Middleborough,	37 37
Chicopee,	37 50	Middleton,	11 88
Cohasset,	53 89	Millbury,	15 95
Concord,	243 76	Monson,	5 64
Deerfield,	11 60	Montague,	22 60
Dennis,	16 20	Natick,	75 29
Dover,	82 04	Needham,	46 40
Dracut,	60 10	Newbury,	63 87
Duxbury,	30 02	Newburyport,	25 26
Easthampton,	14 28	North Andover,	150 78
Essex,	16 00	North Attleborough,	60 50
Falmouth,	100 45	North Reading,	45 00
Fitchburg,	133 58	Northborough,	113 56
Foxborough,	94 65	Northbridge,	17 50
Framingham,	110 55	Northfield,	75 50
Franklin,	40 25	Norwood,	74 64
Gardner,	13 50	Oxford,	27 41
Gloucester,	51 10	Palmer,	57 23
Grafton,	97 75	Pembroke,	21 00
Greenfield,	30 40	Peppereil,	89 89
Groton,	27 75	Plainville,	2 10
Groveland,	38 84	Princeton,	6 25
Hadley,	65 00	Quincy,	29 60
Hamilton,	80 66	Reading,	100 00
Hardwick,	6 60	Rochester,	32 21
Harvard,	54 37	Rockland,	27 14
Harwich,	110 10	Rockport,	9 89
Haverhill,	117 18	Rowley,	69 10
Hingham,	22 69	Russell,	24 00
Holbrook,	12 00	Salisbury,	83 63
Holliston,	22 92	Sandwich,	12 00
Hudson,	37 89	Scituate,	84 50
Huntington,	35 15	Shirley,	13 45
Ipswich,	37 05	Shrewsbury,	79 80
Kingston,	23 52	Somerset,	207 15
Lakeville,	12 48	South Hadley,	73 60
Lancaster,	33 33	Southborough,	55 08
Leicester,	29 00	Spencer,	21 05
Leominster,	45 10	Sterling,	77 75
Lexington,	88 85	Stockbridge,	97 35
Lincoln,	67 95	Stoneham,	91 58
Littleton,	64 22	Stoughton,	19 25
Lowell,	49 51	Sudbury,	147 90

WORK ON STATE HIGHWAYS, 1915 — *Concluded.*

Sutton,	$11 85	Westborough,	$31 05
Swansea,	131 00	Westfield,	55 00
Templeton,	40 12	Westford,	132 55
Tewksbury,	84 00	Westminster,	17 70
Townsend,	84 65	Weston,	84 40
Tyngsborough,	156 75	Westwood,	21 42
Ware,	44 75	Weymouth,	80 68
Warren,	62 11	Wilbraham,	20 16
Wayland,	77 63	Williamstown,	82 50
Webster,	17 33	Wilmington,	65 18
Wellfleet,	32 75	Winchester,	59 60
Wenham,	100 61	Woburn,	151 91
West Boylston,	66 56	Worcester,	13 33
West Bridgewater,	19 80	Yarmouth,	136 00
West Brookfield,	37 59		
West Newbury,	105 16		$9,231 82
West Springfield,	35 00		

APPROPRIATION FOR SUPPRESSION OF GYPSY AND BROWN-TAIL MOTHS.

General Statement.

Balance on hand Nov. 30, 1914,		$88,874 63
Less reimbursement paid for 1914,		39,669 90
Balance for 1915 work,		$49,204 73
Receipts: —		
Andover,	$205 03	
Ayer,	1,240 94	
Barnstable,	899 39	
Boylston,	672 13	
Bridgewater,	22 75	
Cohasset,	393 22	
Danvers,	516 08	
Gloucester,	27 30	
Hingham,	285 01	
Holden,	1,255 34	
Hopkinton,	900 33	
Hudson,	1 27	
Marlborough,	406 41	
Medford,	640 40	
Natick,	47 62	
Amounts carried forward,	$7,513 22	$49,204 73

Amounts brought forward,	$7,513 22	$49,204 73
Receipts — *Con.*		
North Andover,	135 34	
Norton,	86 00	
Princeton,	1,302 34	
Quincy,	6 58	
Raynham,	315 64	
Revere,	57 25	
Rowley,	322 91	
Sherborn,	62 10	
Templeton,	1,460 93	
Topsfield,	2,095 57	
Wakefield,	827 18	
Weymouth,	858 68	
Check return on Lexington pay roll,	3 75	
Fall River,	92 30	
Medford,	269 70	
Natick,	16 53	
Wakefield,	456 63	
New York, New Haven & Hartford Railroad, rebate for damages,	55 00	
Junk sold,	5 18	
Motor cycles sold,	168 00	
Refund from C. J. Jaeger Company,	33 00	
Use of outfit on thinning work,	193 80	
State Forest Commission,	66	
State Forester's expenses,	234 22	
Purchase and planting of forest lands,	40 05	
Dover gypsy moth fund,	428 94	
Sagamore Beach gypsy moth fund,	50 15	
Special North Shore fund,	5,657 36	
Relief fund for unemployed,	1,100 88	
Appropriation for 1915,	100,000 00	
Appropriation for 1916,	75,000 00	
		198,849 89
		$248,054 62
Office expenses: —		
Salaries,	$3,484 30	
Rent,	2,459 96	
Stationery and postage,	1,103 61	
Printing,	851 72	
Experts,	97 50	
Thinning work supplies,	343 53	
Amounts carried forward,	$8,340 62	$248,054 62

Amounts brought forward,	$8,340 62	$248,054 62
Office expenses — *Con.*		
Supplies,	597 77	
Maps, photographs, etc.,	317 13	
Sundries (telephone, lights, water, etc.),	956 08	
Field expenses: —		
Town pay rolls,	17,219 78	
Pay roll,	21,191 42	
Travel,	9,499 11	
Supplies,	77,566 39	
Rent of store,	312 50	
Store equipment,	102 89	
Sundries (teaming, express, freight),	599 42	
Special work,	5,613 48	
Reimbursement,	16,793 55	
		159,110 14
Balance, Nov. 30, 1915,		$88,944 48

Financial Summary of Moth Work by Towns.

The following table shows the reimbursement, amount of supplies furnished, and net amount received from this office by cities and towns for 1914, the required expenditure before receiving reimbursement from the State, the total net expenditure, the amount received for work on private property returned to this office, the amount paid in reimbursement, gross amount of supplies, and total net amount received from this office by cities and towns for 1915, and also the required expenditure for 1916: —

Cities and Towns.	Class.	1914.			1915.						1916.
		Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.	Total Net Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Abington,	3	–	–	–	$1,459 85	–	–	–	–	–	$1,505 35
Acton,	3	$803 89	$695 97	$1,499 86	970 01	$1,150 60	[1] $291 80 139 40	$179 59	$574 77	$754 36	1,005 76
Acushnet,	3	–	–	–	461 61	–	–	–	–	–	487 08
Amesbury,	2	–	–	–	2,681 87	–	–	–	–	–	2,712 77
Andover,	2	–	[2] 864 17	659 14	3,437 11	2,916 08	1,104 46	–	[2] 755 03	187 20	3,577 76
Arlington,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Ashburnham,	3	476 16	114 38	590 54	510 84	858 84	333 80	348 00	341 88	689 88	466 35
Ashby,	3	483 10	46 05	529 15	257 75	465 52	12 08	207 77	264 74	472 51	316 01
Ashland,	3	–	100 55	100 55	583 64	803 48	58 30	–	138 45	138 45	574 00
Athol,	2	–	–	–	2,603 15	–	–	–	–	–	2,677 37
Attleboro,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Auburn,	3	78	131 02	131 80	692 00	468 76	283 43	–	[3] 47 30	–	714 63
Avon,	3	261 06	90 67	351 73	446 40	563 77	82 63	117 37	81 89	199 26	450 61
Ayer,	3	116 68	292 55	409 23	928 05	[4] 851 87	291 75	–	285 60	209 42	975 67
Barnstable,	2	–	[3] 481 14	–	3,503 85	3,626 51	1,112 19	–	[2] 2,862 88	2,388 43	3,788 26
Barre,	3	–	–	–	1,089 64	–	–	–	–	–	1,132 90

Bedford,	3	1,441 80	1,551 20	2,993 00	743 59	1,487 68	[1] 242 50 554 33	700 00	785 90	1,485 90	795 51
Belchertown,	3	–	–	–	392 93	–	–	–	[2] 13 85	–	400 34
Bellingham,	3	–	–	–	401 72	–	–	–	–	–	410 06
Belmont,	2	–	–	–	3,530 53	–	–	–	–	–	4,563 81
Berkley,	3	55 25	21 30	76 55	225 43	277 70	62 68	52 27	16 52	68 79	228 51
Berlin,	3	419 69	[5] 1,720 60	1,540 29	259 20	555 72	423 28	200 00	358 99	558 99	268 13
Beverly,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Billerica,	3	337 84	814 96	1,152 80	2,211 97	2,130 38	[1] 297 00 346 95	–	[2] 784 13	702 54	2,203 17
Blackstone,	3	–	–	–	981 31	–	–	–	–	–	986 20
Bolton,	3	235 19	[5] 2,060 31	1,695 50	303 76	531 84	[1] 169 48 87 00	228 08	590 63	818 71	313 13
Boston,	1	11,752 43	–	11,752 43	5,000 00	23,940 41	18,026 53	3.000 00	–	3,000 00	5,000 00
Bourne,	2	–	–	–	3,132 73	–	–	–	–	–	2,963 65
Boxborough,	3	1,123 63	652 18	1,775 81	115 27	1,076 23	[1] 187 30 11 22	850 00	595 20	1,445 20	122 22
Boxford,	3	1,201 56	490 58	1,692 14	643 07	1,209 14	353 50	566 07	419 29	985 36	541 48
Boylston,	3	457 02	62 31	519 33	217 96	[4] 721 10	273 09	503 14	108 69	611 83	228 33
Braintree,	2	–	[3] 7 99	–	3,568 30	–	–	–	–	–	3,794 33
Brewster,	3	–	–	–	345 60	–	–	–	–	–	353 60
Bridgewater,	3	–	[4] 480 53	457 78	1,844 84	1,844 84	507 58	–	53 71	53 71	1,695 89

[1] Arsenate of lead sold.
[2] Town paid part of the cost of supplies.
[3] Town paid full cost of supplies.
[4] Work financed by State.
[5] Received sprayer from State, town paying one-half the cost, $600.

Cities and Towns.	Class.	1914.			1915.						1916.
		Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.	Total Net Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Brimfield,	3	–	–	–	–	–	–	–	–	–	$263 08
Brockton,	1	–	–	–	$5,000 00	–	–	–	–	–	5,000 00
Brookfield,	3	–	–	–	562 80	–	–	–	–	–	615 24
Brookline,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Burlington,	3	$1,496 05	$503 01	$1,999 06	399 05	$1,022 90	[1] $27 00 189 00	$623 85	$477 79	$1,101 64	389 37
Cambridge,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Canton,	2	440 34	[2] 2,997 60	2,478 42	2,715 96	2,971 74	2,296 66	–	[3] 1,468 66	1,085 83	2,735 52
Carlisle,	3	2,389 92	625 50	3,015 42	196 96	2,052 06	403 13	1,855 10	430 94	2,286 04	264 21
Carver,	3	1,010 18	667 93	1,678 11	838 47	2,197 46	[1] 61 50 878 94	758 99	[2] 2,630 03	2,789 02	847 94
Charlton,	3	–	–	–	576 27	–	–	–	–	–	572 31
Chelmsford,	3	307 60	1,185 21	1,492 81	1,788 36	2,175 23	666 69	386 87	733 19	1,120 06	1,805 84
Chelsea,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Clinton,	2	–	–	–	3,705 84	–	–	–	–	–	3,788 36
Cohasset,	2	–	[4] 1,990 67	1,597 45	4,078 02	–	–	–	–	–	3,950 36
Concord,	2	378 76	785 41	1,007 09	3,684 74	3,665 36	[1] 164 49 617 29	–	528 23	407 08	3,810 94
Dana,	3	–	–	–	180 76	–	–	–	–	–	187 55

Danvers,	2	–	[3,4] 1,967 97	1,214 38	3,099 00	2,961 78	1,083 90	–	[5] 752 16	491 95	3,441 66
Dartmouth,	3	–	–	–	2,119 47	–	–	–	–	–	2,301 33
Dedham,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Deerfield,	3	–	3 76	3 76	1,039 83	–	–	–	–	–	1,060 71
Dennis,	3	–	–	–	548 99	–	–	–	–	–	602 44
Dighton,	3	–	–	–	598 63	–	–	–	–	–	693 15
Douglas,	3	–	–	–	523 43	–	–	–	–	–	534 02
Dover,	2	–	–	–	3,354 20	–	–	–	–	–	3,309 97
Dracut,	3	487 22	849 75	1,336 97	1,012 66	1,610 66	[1] 100 00 845 53	500 00	734 64	1,234 64	1,035 82
Dudley,	3	–	–	–	848 20	–	–	–	–	–	1,000 51
Dunstable,	3	910 42	[3] 1,188 65	1,774 07	163 98	813 79	305 47	649 81	192 53	842 34	170 28
Duxbury,	3	199 04	202 35	401 39	1,456 14	1,878 25	327 00	400 00	252 27	652 27	1,562 02
East Bridgewater,	3	–	[3] 1,930 39	1,330 39	1,062 14	714 63	–	–	–	–	1,160 47
Easton,	2	–	–	–	2,847 19	–	–	–	–	–	2,914 34
Edgartown,	3	–	–	–	552 24	–	–	–	[5] 1 45	–	571 79
Essex,	3	271 40	141 22	412 62	507 19	[4] 927 96	340 00	420 77	40 17	460 94	530 31
Everett,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Fairhaven,	3	–	–	–	1,400 44	–	–	–	–	–	1,800 64
Fall River,	1	–	–	–	5,000 00	–	–	–	[5] 92 30	–	5,000 00

[1] Arsenate of lead sold.
[3] Received sprayer from State, town paying one-half the cost, $600.
[4] Work financed by State.
[5] Town paid full cost of supplies.
[2] Town paid part of the cost of supplies.

Cities and Towns.	Class.	1914.			1915.						1916.
		Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.	Total Net Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Falmouth,	1	–	–	–	$5,000 00	–	–	–	–	–	$5,000 00
Fitchburg,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Foxborough,	3	–	–	–	1,093 67	–	–	–	–	–	1,126 45
Framingham,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Franklin,	3	–	–	–	1,918 97	[1] $157 14	–	–	–	–	2,026 09
Freetown,	3	–	–	–	353 78	–	–	–	–	–	458 11
Gardner,	2	–	–	–	4,538 55	–	–	–	–	–	4,617 46
Georgetown,	3	$106 49	[2] $1,909 44	$1,715 93	528 67	1,083 84	[3] $37 20 687 13	$555 17	$478 16	$1,033 33	550 91
Gloucester,	1	–	[1] 526 18	263 09	5,000 00	4,893 21	1,890 51	–	[4] 558 84	226 03	5,000 00
Grafton,	3	–	–	–	1,297 49	777 07	300 00	–	[5] 1 08	–	1,530 30
Great Barrington,	2	–	–	–	2,770 19	–	–	–	–	–	4,156 91
Greenfield,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Groton,	3	300 00	754 94	1,054 94	1,768 95	1,943 01	118 00	–	503 71	503 71	1,838 09
Groveland,	3	543 14	163 23	706 37	506 16	857 34	337 54	351 18	192 97	544 15	554 52
Halifax,	3	661 16	22 76	683 92	269 24	684 44	233 75	400 00	6 45	406 45	277 62
Hamilton,	2	–	774 01	774 01	2,466 01	2,321 85	1,016 99	–	[4] 519 88	300 58	2,676 86

Hanover,	3	1,464 37	1,176 11	2,640 48	852 74	1,322 53	167 40	350 00	432 79	782 79	915 19
Hanson,	3	387 23	276 76	663 99	593 40	997 37	341 58	403 97	148 87	552 84	618 20
Harvard,	3	7 91	[2] 2,405 56	1,813 47	723 44	1,135 91	[3] 372 12 394 77	412 47	1,015 11	1,427 58	816 90
Harwich,	3	–	–	–	669 28	–	–	–	–	–	727 06
Haverhill,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Hingham,	2	–	[1] 1,258 18	1,007 55	3,314 48	–	–	–	–	–	3,494 86
Holbrook,	3	–	–	–	680 29	–	–	–	–	–	713 13
Holden,	3	2,008 92	299 57	2,308 49	743 11	[1] 1,868 96	308 50	1,125 85	175 08	1,300 93	764 10
Holliston,	3	–	58	58	813 98	–	–	–	–	–	858 93
Hopedale,	2	–	–	–	2,682 36	–	–	–	–	–	3,567 90
Hopkinton,	3	72 53	60 89	133 42	755 66	[1] 736 10	–	–	[4] 65 90	56 34	794 16
Hubbardston,	3	–	–	–	302 89	–	–	–	–	–	317 51
Hudson,	3	–	[2] 1,976 21	1,376 21	1,692 78	1,692 70	787 30	–	526 35	526 35	1,712 32
Hull,	2	–	–	–	3,548 58	–	–	–	–	–	3,688 76
Ipswich,	3	249 25	957 38	1,206 63	2,210 78	2,152 87	1,343 50	–	[4] 764 81	706 90	2,287 70
Kingston,	3	1,132 74	294 73	1,427 47	672 99	1,113 83	[3] 13 00 305 34	440 84	262 64	703 48	682 48
Lakeville,	3	–	–	–	513 60	–	–	–	[5] 79 00	–	513 82
Lancaster,	2	–	–	–	2,765 93	–	–	–	–	–	2,815 60
Lawrence,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00

[1] Work financed by State.
[2] Received sprayer from State, town paying one-half the cost, $600.
[3] Arsenate of lead sold.
[4] Town paid part of the cost of supplies.
[5] Town paid full cost of supplies.

Cities and Towns.	Class.	1914.			1915.						1916.
		Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.	Total Net Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Leicester,	3	–	–	–	$1,021 31	–	–	–	–	–	$1,005 64
Lenox,	2	–	–	–	3,645 75	–	–	–	–	–	3,390 83
Leominster,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Lexington,	2	$1,098 57	$931 09	$1,843 44	3,605 05	$6,005 31	[1] $3 65 1,220 43	$800 00	$1,310 21	$1,847 17	4,011 27
Leyden,	3	–	–	–	91 19	–	–	–	–	–	98 67
Lincoln,	3	162 48	1,700 38	1,862 86	1,604 02	2,779 80	[1] 292 50 927 85	–	1,446 44	1,446 44	2,069 40
Littleton,	3	343 47	697 82	1,041 29	493 03	686 15	[1] 243 60 106 75	193 12	465 27	658 39	506 47
Lowell,	1	–	386 58	193 29	5,000 00	4,956 43	3,254 28	–	[2] 387 41	–	5,000 00
Lunenburg,	3	662 46	676 75	1,339 21	602 52	1,081 44	[1] 143 60 2,037 59	478 88	606 72	1,085 60	646 06
Lynn,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Lynnfield,	3	1,849 81	567 44	2,417 25	525 74	1,574 21	597 90	1,048 47	529 13	1,577 60	538 08
Maldon,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Manchester,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Mansfield,	3	–	–	–	1,342 09	–	–	–	–	–	1,809 21
Marblehead,	2	–	–	–	4,444 38	–	–	–	–	–	4,584 16

Marion,	3	–	–	–	2,350 14	–	–	–	–	–	2,252 33
Marlborough,	2	–	[3,4] 2,486 28	1,629 03	4,402 46	8,160 90	[1] 60 00 2,398 44	838 54	803 13	1,481 04	4,522 88
Marshfield,	3	799 75	871 93	1,671 68	1,045 51	1,344 81	[1] 77 40 1,193 60	299 30	152 53	451 83	1,120 58
Mashpee,	3	778 00	253 03	1,031 03	106 40	1,029 98	597 08	923 58	437 85	1,361 43	143 50
Mattapoisett,	3	–	–	–	758 23	–	–	–	–	–	938 57
Maynard,	3	–	–	–	1,652 82	–	–	–	–	–	1,670 16
Medfield,	3	–	–	–	1,022 12	–	–	–	–	–	971 59
Medford,	1	–	[2] 640 40	–	5,000 00	–	–	–	[2] 269 70	–	5,000 00
Medway,	3	–	–	–	716 36	–	–	–	–	–	733 08
Melrose,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Mendon,	3	–	–	–	287 03	–	–	–	–	–	296 92
Merrimac,	3	951 96	216 59	1,168 55	537 47	1,071 09	[1] 26 75 224 35	533 62	211 99	745 61	558 59
Methuen,	2	65 66	[4] 1,135 05	973 70	3,754 86	3,605 96	[1] 208 85 1,755 37	–	[5] 929 23	611 86	3,893 50
Middleborough,	3	805 55	836 47	1,642 02	1,986 31	3,000 65	[1] 63 74 1,410 00	998 42	1,075 64	2,074 06	1,984 82
Middleton,	3	840 36	226 83	1,067 19	371 73	1,175 03	[1] 29 50 103 50	750 00	227 22	977 22	369 60
Milford,	2	–	–	–	4,061 36	–	–	–	–	–	4,188 83
Millbury,	3	–	–	–	1,285 32	–	–	–	[2] 1 08	–	1,359 65

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Cities and Towns.	Class.	1914.			1915.						1916.
		Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.	Total Net Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Millis,	3	–	–	–	$558 17	–	–	–	–	–	$589 23
Milton,	1	–	[1] $18 50	–	5,000 00	–	–	–	–	–	5,000 00
Montague,	3-2	–	–	–	2,059 57	–	–	–	–	–	2,401 59
Nahant,	2	–	–	–	3,474 48	–	–	–	–	–	3,375 80
Nantucket,	3	–	40	$0 40	1,836 92	–	–	–	–	–	1,869 67
Natick,	2	–	[1] 92 15	–	3,647 16	$5,136 14	$234 35	–	[2] $36 29	–	3,717 30
Needham,	2	–	–	–	3,365 53	–	–	–	–	–	3,604 35
New Bedford,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
New Braintree,	3	–	–	–	164 95	–	–	–	–	–	168 90
New Salem,	3	–	–	–	162 70	–	–	–	–	–	159 18
Newbury,	3	$1,049 05	531 58	1,580 63	635 69	1,386 54	[3] 242 59 719 07	$750 85	665 87	$1,416 72	667 61
Newburyport,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Newton,	1	1,598 54	4,789 55	3,993 31	5,000 00	12,837 60	15,287 83	–	4,372 97	2,186 48	5,000 00
Norfolk,	3	346 90	111 96	458 86	465 54	861 59	199 52	300 00	89 64	389 64	468 54
North Andover,	3-2	–	[4] 775 57	640 23	2,301 33	2,294 72	[3] 140 81 1,020 54	–	[1] 677 07	670 46	2,416 82
North Attleborough,	2	–	–	–	3,876 10	–	–	–	–	–	3,825 19

North Brookfield,	3	–	–	–	800 17	–	–	–	–	–	818 23
North Reading,	3	1,585 67	1,017 92	2,603 59	393 09	1,624 84	557 76	1,200 00	820 06	2,020 06	397 32
Northborough,	3	904 35	448 73	1,353 08	770 71	1,403 66	301 20	632 95	429 91	1,062 86	795 29
Northbridge,	3	–	–	–	2,232 67	–	–	–	[2] 1 08	–	2,296 00
Norton,	3	–	–	–	660 60	[5] 107 75	–	–	–	–	670 72
Norwell,	3	404 90	1,231 53	1,636 43	475 65	812 05	714 27	300 00	657 69	957 69	553 87
Norwood,	2-1	–	–	–	4,449 52	–	–	–	–	–	5,000 00
Oak Bluffs,	3	–	–	–	779 00	–	–	–	–	–	800 77
Oakham,	3	–	–	–	147 11	–	–	–	–	–	154 44
Orange,	3	–	–	–	1,605 70	–	–	–	[2] 1 80	–	1,612 17
Orleans,	3	–	–	–	1,534 24	–	–	–	40	40	1,932 24
Oxford,	3	–	–	–	836 65	–	–	–	[2] 1 08	–	843 57
Palmer,	3	–	–	–	2,103 39	–	–	–	–	–	2,147 86
Paxton,	3	–	–	–	163 18	–	–	–	–	–	168 60
Peabody,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Pembroke,	3	652 37	[5] 1,920 17	1,972 54	466 61	1,307 96	618 42	732 97	549 98	1,282 95	498 69
Pepperell,	3	937 53	571 79	1,509 32	943 42	1,495 04	369 82	551 62	572 47	1,124 09	942 18
Petersham,	3	–	–	–	460 97	–	–	–	–	–	416 26
Phillipston,	3	–	–	–	124 70	–	–	–	–	–	122 27
Plainville,	3	200 00	150 97	350 97	417 16	496 12	134 28	–	43 34	43 34	423 38

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Cities and Towns.	Class.	1914.			1915.						1916.
		Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.	Total Net Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Plymouth,	1	–	–	–	$5,000 00	–	–	–	–	–	$5,000 00
Plympton,	3	$1,789 59	$284 34	$2,073 93	182 82	$1,280 13	[1] $21 65 108 37	$1,097 31	$225 49	$1,322 80	186 21
Princeton,	3	6,915 36	682 96	7,598 32	594 05	[2] 2,516 68	247 80	1,822 63	387 33	2,209 96	566 05
Provincetown,	3	–	–	–	969 35	–	–	–	–	–	980 88
Quincy,	1	–	[3] 1,133 92	–	5,000 00	–	–	–	–	–	5,000 00
Randolph,	3	–	–	–	1,153 50	–	–	–	–	–	1,266 86
Raynham,	3	122 63	47 45	170 08	313 30	332 37	126 09	–	160 62	160 62	396 38
Reading,	2	32 28	1,850 11	1,512 37	3,007 58	2,794 41	2,171 80	–	[3] 1,418 15	509 81	3,199 81
Rehoboth,	3	–	–	–	328 34	–	–	–	–	–	428 10
Revere,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Rochester,	3	–	–	–	415 98	–	–	–	–	–	420 63
Rockland,	3	–	–	–	2,171 19	2,859 90	–	–	[4] 1,731 13	1,131 13	2,191 96
Rockport,	3	–	–	–	1,609 42	–	–	–	–	–	1,634 04
Rowley,	3	–	[4] 608 57	285 66	869 73	862 32	473 03	–	[3] 525 37	517 96	819 66
Royalston,	3	–	–	–	299 39	–	–	–	–	–	299 06
Rutland,	3	–	–	–	366 93	–	–	–	–	–	377 27
Salem,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00

Salisbury,	3	207 36	[3] 1,874 54	1,481 90	590 16	1,117 26	[1] 63 05 329 82	527 10	488 32	1,015 42	683 78
Sandwich,	3	219 62	156 93	376 55	570 50	871 64	76 50	250 00	381 94	631 94	610 14
Saugus,	2	851 16	[4] 1,027 34	1,673 03	2,777 34	3,045 30	1,832 25	219 44	[3] 592 89	520 17	2,855 15
Scituate,	3	2,749 10	1,063 61	3,812 71	2,279 01	3,497 92	979 52	1,100 00	895 42	1,995 42	2,375 58
Seekonk,	3	–	–	–	637 08	–	–	–	–	–	750 31
Sharon,	3	–	–	–	1,484 78	–	–	–	–	–	1,598 84
Sherborn,	3	–	[4] 326 74	264 64	957 37	1,099 75	1,072 31	100 00	372 25	472 25	959 15
Shirley,	3	160 06	405 15	565 21	524 04	500 87	176 05	–	[3] 298 26	275 09	555 13
Shrewsbury,	3	–	38 61	38 61	1,090 37	907 12	257 01	–	[3] 98 30	–	1,191 35
Somerset,	3	–	–	–	615 49	–	–	–	–	–	735 12
Somerville,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Southborough,	3	348 94	238 46	587 40	926 47	1,374 68	689 66	400 00	375 33	775 33	945 91
Spencer,	3	–	–	–	1,457 87	–	–	–	–	–	1,451 60
Springfield,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Sterling,	3	846 24	426 59	1,272 83	508 38	560 12	161 90	37 26	326 75	364 01	548 03
Stockbridge,	3	–	–	–	1,991 67	–	–	–	–	–	1,807 00
Stoneham,	3-2	69 99	675 69	746 68	2,362 14	2,562 14	1,536 69	200 00	881 32	1,081 32	2,438 34
Stoughton,	3	110 42	866 06	976 48	1,666 30	1,605 37	250 83	–	[3] 231 57	170 64	1,740 18
Stow,	3	200 00	[3] 2,248 60	1,848 60	462 68	879 20	[1] 437 81 295 95	416 52	677 21	1,093 73	590 61

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Cities and Towns.	Class.	1914.			1915.						1916.
		Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.	Total Net Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Sturbridge,	3	–	–	–	$376 69	–	–	–	–	–	$382 04
Sudbury,	3	$956 77	$746 22	$1,702 99	599 43	$1,130 01	[1] $213 13 476 99	$530 58	$791 36	$1,321 94	646 39
Sutton,	3	–	–	–	583 98	–	–	–	–	–	619 97
Swampscott,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Swansea,	3	–	–	–	499 77	–	–	–	–	–	780 74
Taunton,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Templeton,	3	1,383 13	243 73	1,626 86	789 90	[2] 854 31	645 66	64 41	122 93	187 34	810 03
Tewksbury,	3	1,151 70	1,018 45	2,170 15	676 85	1,573 18	299 87	896 33	709 32	1,605 65	744 71
Tisbury,	3	–	–	–	807 58	–	–	–	–	–	863 41
Topsfield,	3	–	294 91	[3] 207 51	1,628 20	[2] 1,685 80	665 44	57 60	230 06	287 66	1,717 93
Townsend,	3	601 86	552 84	1,154 70	567 99	1,145 81	425 65	400 00	350 01	750 01	578 13
Truro,	3	–	–	–	169 23	–	–	–	147 54	147 54	207 68
Tyngsborough,	3	1,610 33	1,021 85	2,632 18	283 11	1,870 03	[1] 36 00 512 28	1,450 00	757 90	2,207 90	301 37
Upton,	3	–	–	–	507 46	–	–	–	[4] 1 08	–	523 00
Uxbridge,	3	–	–	–	1,608 55	–	–	–	[4] 1 08	–	1,744 11
Wakefield,	2	–	[4] 827 18	–	4,766 51	3,170 50	–	–	[4] 456 63	–	4,981 12

Walpole,	2	–	–	–	2,864 54	–	–	–	–	–	3,014 00
Waltham,	1	681 62	1,454 30	1,408 77	5,000 00	7,380 64	2,971 40	–	[3] 2,614 62	1,190 32	5,000 00
Wareham,	3-2	–	–	–	1,918 00	–	–	–	–	–	2,672 06
Warren,	3	–	–	–	1,024 81	–	–	–	–	–	1,066 75
Warwick,	3	–	–	–	187 68	–	–	–	–	–	182 11
Watertown,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Wayland,	3	265 44	922 70	1,188 14	1,205 84	1,225 54	[1] 437 12 506 24	–	1,010 23	1,010 23	1,207 28
Webster,	2	–	–	–	3,376 96	–	–	–	–	–	3,606 32
Wellesley,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Wellfleet,	3	–	–	–	336 92	–	–	–	–	–	342 76
Wendell,	3	–	–	–	205 15	–	–	–	–	–	219 73
Wenham,	3	275 25	571 71	846 96	1,321 30	1,230 51	444 39	–	[3] 705 21	614 42	1,464 86
West Boylston,	3	–	77	77	397 72	[3] 980 87	239 74	390 64	[3,5] 668 96	1,059 60	411 84
West Bridgewater,	3	842 26	366 55	1,208 81	656 62	1,282 31	487 66	600 00	402 45	1,002 45	750 03
West Newbury,	3	549 47	215 42	764 89	430 32	992 79	355 81	–	[3,5] 1,578 35	939 91	446 39
Westborough,	3	377 53	138 61	516 14	1,333 45	1,293 64	399 76	–	[3] 189 17	149 36	1,337 09
Westford,	3	615 82	912 82	1,528 64	902 64	1,735 66	488 84	833 02	914 07	1,747 09	970 43
Westminster,	3	1,971 05	130 62	2,101 67	390 89	1,587 59	140 91	1,196 70	105 41	1,302 11	401 17
Weston,	2	–	1,539 63	1,231 70	3,516 77	5,698 32	2,315 00	–	1,862 87	931 43	3,484 34

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Cities and Towns.	Class.	1914.			1915.						1916.
		Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.	Total Net Expenditure.	Private Work.	Reimbursement.	Tools supplied.	Total Amount received from State.	Required Expenditure.
Westport,	3	–	–	–	$813 32	–	–	–	–	–	$982 63
Westwood,	3	–	–	–	1,788 42	–	–	–	–	–	1,804 62
Weymouth,	2-1	–	[1] $1,873 06	$1,014 38	4,808 27	–	–	–	–	–	5,000 00
Whately,	3	–	5 26	5 26	291 84	–	–	–	–	–	303 93
Whitman,	3	–	–	–	2,256 00	–	–	–	–	–	2,303 84
Williamsburg,	3	–	–	–	467 74	–	–	–	–	–	485 61
Wilmington,	3	$1,296 57	812 67	2,109 24	792 29	$1,755 28	$776 72	$950 00	$371 13	$1,821 13	843 89
Winchendon,	3	902 57	325 73	1,228 30	1,737 45	2,016 10	641 69	278 65	331 69	610 34	1,778 80
Winchester,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Winthrop,	1	–	–	–	5,000 00	–	–	–	–	–	5,000 00
Woburn,	2-1	2,776 85	867 21	3,470 62	4,933 61	4,203 20	623 55	–	[2] 219 29	–	5,000 00
Worcester,	1	–	[1, 3] 3,024 06	1,512 03	5,000 00	10,344 80	6,845 97	–	1,453 86	726 93	5,000 00
Worthington,	3	–	–	–	149 63	–	–	–	–	–	153 14
Wrentham,	3	–	–	–	620 34	–	–	–	–	–	642 18
Yarmouth,	3	–	–	–	1,048 39	–	–	–	–	–	1,023 11

[1] Town paid part of the cost of supplies. [2] Town paid full cost of supplies. [3] Received sprayer from State, town paying one-half the cost, $600.

A State highway planted with spruce trees, Groton.

Report of the State Forester on the Resolve providing for an Investigation relative to the Taking of Mount Holyoke as a State Reservation.

To the General Court.

In the matter of the investigation relative to a State reservation bein made of Mount Holyoke, as directed by the General Court in the following resolve,

"That the state forester shall investigate and report to the next general court, not later than the third Wednesday of January, as to the advisability, practicability and cost of taking and maintaining Mount Holyoke as a state reservation, with such other information relating thereto as he may deem expedient," I respectfully state that this investigation has been made and is herewith reported upon. The State Forester was more or less familiar with the property in question, and besides visiting the grounds himself, delegated one of his assistants, Mr. Frank L. Haynes, to make a survey of Mount Holyoke in order to present a comprehensive view of the situation.

The basis of this report is therefore the thorough study made by Mr. Haynes during the month of September.

Location.

Mount Holyoke, an elevation of 954 feet, occupies a commanding position on and forms a part of the western end of that portion of the Holyoke Range lying east of the Connecticut River. The dividing line between the townships of South Hadley and Hadley follows approximately the ridge of the range, thereby placing the mountain partly in both townships.

Area.

The area covered during the investigative work consists of a tract of 256 acres known as the Mount Holyoke Reservation, which is at present owned by the Mount Holyoke Company. This tract includes the summit of the mountain and land on all sides of it within the limits shown upon the plan in the files of the State Forester's office. Upon this area are located the Mount Holyoke Hotel and several smaller buildings used in connection with the reservation.

Topography and Soils.

With the exception of parts of the lower slopes the mountain is of a steep and rugged nature, having a rise in elevation from base to summit of about 900 feet in 3,000, and on the steeper portions a rise of 450 feet in 1,000. For the most part the area lies between 300 and 900 foot levels.

The main material making up the ground structure of the mountain is basalt. This hard stone occurs to a considerable extent in solid ledge formation, and especially on the ridge and upper slopes, where it is found

completely exposed or very lightly covered with soil. Through the slow process of disintegration and wash, natural forces have succeeded in covering the lower slopes and pockets with sufficient soil for a good growth of trees to thrive, and on the extreme lower slopes the land is suitable for farming, and is used as such.

It is upon the lower slopes, where the soil is of sufficient depth, that any future tree growth of an intensive nature can be carried on.

Ground Cover.

The tree growth and smaller plants found upon the area are as follows: —

Chestnut.	Basswood.	Butternut.
Oak (red).	Maple.	Chestnut oak.
Oak (white).	Elm.	Moosewood.
Oak (black).	Cherry.	Flowering dogwood.
Hemlock.	Poplar.	Alder.
White pine.	Red pine.	Mountain laurel.
Birch (white).	Red cedar.	Witch hazel.
Birch (black).	Ironwood.	Juniper.
Birch (yellow).	Beech.	Sumach.
Ash.	Willow.	Sassafras.
Hickory.	Sycamore.	Blueberry.

Some of the above listed species occur in small numbers, and are listed mainly to give an idea of the varied flora found upon the reservation.

On the whole, the tree growth found upon the area is not of especial value from a commercial point of view. About one-third of the area is at present stocked with trees of suitable size for lumber, poles and ties.

Chestnut.

Among the trees upon this area the chestnut predominates. This species occurs either in pure stands or scattered among other hardwoods and hemlock, and ranges in size from young sprouts up to trees of 20 inches in diameter. Unfortunately, the chestnut now standing on the reservation is in a dead or dying condition, owing to the prevalence of the chestnut blight, or bark disease. The investigation showed that nearly 97 per cent. of the trees of this species were infected, including trees of large size, and it is safe to assume that within two years nearly every chestnut tree on the reserve will be killed. These dead and dying trees contain in total several thousand feet B. M. of lumber and ties, and should be cut and utilized while they have a commercial value.

Hemlock.

This tree occurs either in nearly pure small stands or scattered among the hardwood growth. Several large specimens are present on the reserve, but the combined stands of hemlock constitute only a small amount.

White Pine.

There is but one small stand of this species upon the area. It covers about 2 acres on one of the lower slopes, and was evidently planted about thirty-five years ago. The stand has made an average growth of about 1 foot per year in height, and is mainly important in that it gives a good indication of what this valuable tree species will do under the conditions that obtain on the Mount Holyoke area where sufficient soil is available.

Oaks.

Many good specimens of red, white and black oaks are found on the reservation, the larger of them reaching a diameter of 16 to 18 inches. The major part of the oak growth consists of medium and small sized trees.

Other Species.

Ash, birch, hickory, poplar and remaining listed species occur on many parts of the reserve, but are mostly of small size and of little value other than for cordwood. On the ridges and upper slopes, where exposed conditions and shallow soil obtain, the growth is of a poor and stunted nature and must continue to remain so. While the larger part of the tree growth upon the area is not of especial value commercially, it is of very material value as a covering for the mountain, thereby enhancing its natural beauty from an æsthetic view-point.

Watershed.

The area under consideration is of importance as a watershed only in so far as it forms a part of the Holyoke Range as a whole.

Forestry Practice.

The Mount Holyoke lands as a whole do not constitute a good forestry proposition. On the lower slopes, as before stated, soil conditions are such that forestry practice could be carried on to a certain extent. This would mean the clear cutting of the dead chestnut and the usual necessary thinnings in the remaining growth where it would pay to make them, to be followed by planting the area to pine. Inasmuch as this suitable forestry area is small (about 100 acres), the returns through forestry practice necessarily would be small even over a long period of time. On the upper slopes the growth should be left about as it is, except in places where light thinnings could be made to pay for the expense involved.

Remarks.

Among the many elevations found within the boundaries of Massachusetts the position occupied by Mount Holyoke is in many ways unusual and unique. Rising as it does out of the fertile and highly cultivated valley of the Connecticut River, and to a height sufficient to command views over an extensive radius in nearly all directions, it is possible to observe from the summit of Mount Holyoke combinations of scenery of a nature that can be obtained from but few elevations in this entire country.

From the Mount Holyoke Hotel, located on the summit of the mountain, there may be seen mountains in 4 States, also 40 towns, cities and villages, 32 of which are in Massachusetts and 8 in Connecticut, namely: —

MOUNTAINS.

Monadnock, New Hampshire.
Falcott, Avon, Conn.
Sugar Loaf, Massachusetts.
Tom, Massachusetts.
Green, Vermont.
Greylock, Massachusetts.
Norwottock, Massachusetts.
East and West Rock, New Haven, Conn.
Wachusett, Massachusetts.
Toby, Massachusetts.
Nonotuck, Massachusetts.

TOWNS.

Northampton.
Whately.
North Amherst.
South Hadley.
Longmeadow.
Blandford.
Thompsonville, Conn.
Suffield, Conn.
Haydenville.
South Deerfield.
Amherst.
Wilbraham.
West Springfield.
Ludlow.
Windsor, Conn.
Somers, Conn.
Williamsburg.
Greenfield.
South Amherst.
North Wilbraham.
Agawam.
East Windsor, Conn.
Goshen.
Shelburne.
Pelham.
Springfield.
Southampton.
Enfield, Conn.
Hadley.
Sunderland.
Belchertown.
Chicopee.
Easthampton.
Hatfield.
North Hadley.
Granby.
Holyoke.
Montgomery.
Hartford, Conn.
West Hartford, Conn.

SOME OF THE OBJECTS OF INTEREST VIEWED FROM THE MOUNTAIN.

State Hospital, Round Hill, Smith College and Clark Institute in Northampton.
Williston Seminary, Easthampton.
Amherst College, Massachusetts Agricultural College, and Mount Pleasant, Amherst.
Mount Holyoke College at South Hadley.
Wesleyan Academy at Wilbraham.
United States armory at Springfield.
Manufacturing city of Holyoke.
Ingleside, South Holyoke.
Old Hadley
Ox Bow Island.
Shepherd's Island in the Connecticut River.

The mountain located as it is among so many well-populated towns and cities becomes readily accessible to many thousands of people, the more so owing to the fact that an excellent automobile road runs clear to the summit.

The natural beauties of Mount Holyoke and the very excellent scenic views to be obtained from it have been familiar to thousands of people for many years.

The Mountain House.

The first house was built in 1821 and replaced in 1851. The present hotel is a wooden building about 75 by 165 feet with 15-foot veranda on all four sides, having a main office floor 20 by 155 feet, good dining room, parlor, library and observation room, and can accommodate 60 to 75 people at one time. All of the registers of the hotel since 1822 have been preserved and are open for inspection. Many prominent names appear, among them those of Abraham Lincoln, James K. Polk and Jenny Lind. The hotel has been returning a profit to the company in recent years. Other buildings on the reservation consist of the reservation superintendent's house, stable, power house, workshop and a covered incline railway running up to the Mountain House. The buildings are in a good state of repair.

Automobile Road.

The macadam automobile road from the base to the summit of Mount Holyoke constitutes what is no doubt as fine a road as can be found running to the summit of any mountain in the Commonwealth.

Former Ownership.

The property was owned for many years by the Dwight family, who maintained there a hotel for the service of the many who visited it because of the great beauty of its situation. The buildings erected by them cost not far from $100,000 and are in good condition at the present time. Owing to death in the family there was a well-grounded fear that the property might be sold to some one who would cut the timber and otherwise disfigure the mountain. To avoid this the Mount Holyoke Company was formed. Its sole purpose was to preserve the mountain for the benefit of the community at large. In furtherance of this object the Dwight family turned in all of its property to the Mount Holyoke Company in consideration of 250 shares of the par value of $100 each of the capital stock of the Mount Holyoke Company, or a total of $25,000. There was paid in by other stockholders $23,000 in cash for 230 shares of like par value. In addition to this, $32,000 has been raised by loans. The cash subscriptions and loans were used very largely by the company for improving the approach to the top of the mountain, the buildings, etc. The macadam roads up the mountain cost $38,000.

Stockholders.

The following list contains the names and amount of stock held by the various owners at the present time.

List of Stockholders.	Number of shares.
Goetting, A. H., 269 Bridge Street, Springfield, Mass.,	10
Bridgman, C. J., 187 Elm Street, Northampton, Mass.,	1
Bell, Clinton E., 25 Harrison Avenue, Springfield, Mass.,	2
Brewer, Frances, 138 Elm Street, Northampton, Mass.,	2
Cooley, Clarissa A., 119 Farrington Street, Hartford, Conn.,	2
Clarke, Christopher, 40 Hawley Street, Northampton, Mass.,	2
Dwight, Helen M., 31 Mount Morris Park, West, New York City, care of R. E. Dwight,	12
Dwight, Kirby, 31 Mount Morris Park, West, New York City, care of R. E. Dwight,	10
Dwight, Katharine W., 31 Mount Morris Park, West, New York City, care of R. E. Dwight,	10
Dwight, Marion E., 31 Mount Morris Park, West, New York City, care of R. E. Dwight,	10
Dwight, Ellsworth E., 192 Summit Avenue, Summit, N. J., care of R. E. Dwight,	10
Dwight, Richard E., 96 Broadway, New York City,	10
Gillett, Frederick H., House of Representatives, Washington, D. C.,	2
Green, Addison L., 1229 Northampton Street, Holyoke, Mass.,	1
Hemphill, Ashton E., Holyoke, Mass.,	1
Judd, Chas. C., 1495 Northampton Street, Holyoke, Mass.,	1
Judd, John K., 48 Fairfield Avenue, Holyoke, Mass.,	1
Ketcham, Genevieve, 31 Mount Morris Park, West, New York City, care of R. E. Dwight,	16
Ketcham, Everett P., 120 West 122d Street, New York City,	16
Lyman, Frank, 82 Wall Street, New York City,	10
Look, Estate of Frank N., Florence, Mass.,	2
Leggett, J. Dwight, care of R. E. Dwight,	20
Leggett, Noel B., care of R. E. Dwight,	21
Leggett, Schuyler M., care of R. E. Dwight,	21
Metcalf, Joseph, Northampton Street, Holyoke, Mass.,	50
Metcalf, Frank H., Holyoke, Mass.,	2
Metcalf, Howard F., 163 Walnut Street, Holyoke, Mass.,	1
Newton, James H., Northampton Street, Holyoke, Mass.,	50
Page, Thomas C., Chicopee Falls, Mass.,	2
Page, Irving H., Chicopee Falls, Mass.,	10
Skinner, Joseph A., 206 Elm Street, Holyoke, Mass.,	50
Shores, H. T., 177 Elm Street, Northampton, Mass.,	1
Shores, Mabel D., 177 Elm Street, Northampton, Mass.,	1
Steiger, Albert, Ridgewood Terrace, Springfield, Mass.,	1
Stern, Lilian D., Westfield, New Jersey, care of R. E. Dwight,	16
Schillaire, A. J., 203 Bridge Street, Northampton, Mass.,	1
Tilley, Estate of John, 181 Northampton Street, Holyoke, Mass.,	1
White, Alfred T., 40 Remsen Street, Brooklyn, N. Y.,	5
White, Annie J. L., 40 Remsen Street, Brooklyn, N. Y.,	5
Williston, Estate of A. L., 35 Round Hill, Northampton, Mass.,	10
Wigglesworth, Geo. W., 53 State Street, Boston, Mass.,	3
Westerfield, Florence, Upper Montclair, N. J., care of R. E. Dwight,	16
Walker, Marion D., 11 Mount Morris Park, West, New York City, care of R. E. Dwight,	62
	480

The following is the last inventory of the company's property and was made in 1913: —

Hotel with new part,	$40,000
Furniture,	1,000
Two dwelling houses,	1,800
Farm (21 acres),	1,500
Barns and garage,	2,000
Forest land (236 acres),	10,000
New roads,	33,000
Four horses,	600
Carriages,	300
John Dwights Avenue,	5,000
Farm tools and wagons,	200
Ice house,	100
Apple orchard,	210
Total,	$95,710

The following is the last report to the Commissioner of Corporations, Boston, Mass. (May 1, 1915): —

Real estate,	$60,000 00
Machinery,	1,000 00
Cash and receivables,	2 32
Profit and loss,	17,677 36
Total,	$78,669 68
Balance capital stock outstanding,	$48,100 00
Funded indebtedness,	15,000 00
Floating indebtedness,	15,569 68
Total,	$78,669 68

The property was taxed as follows in 1915: —

Land, South Hadley,	$1,000	
Land, Hadley,	4,805	
Total,		$5,805
Buildings, South Hadley,	$5,500	
Buildings, Hadley,	4,700	
		10,200
Total,		$16,005

HOTEL RECEIPTS AND EXPENSES.

Receipts for 1915.

Board,	$5,624 59
Admissions,	687 30
Expense,	54 08
Soda,	72 75
Postals,	228 50
Candy,	43 87
Pool,	5 15
Livery,	157 30
Cash advanced by J. A. Rowell,	170 38
Total,	$7,043 92

Expenses for 1915.

Supplies,	$2,173 86
Livery,	61 50
Expense, painting and repairs,	1,240 66
Soda,	42 20
Postals,	131 42
Candy,	42 62
Help,	1,983 00
Advertising,	323 73
Miscellaneous (Lyman, C. Clark, Interest and Insurance),	1,039 57
Balance in bank,	5 36
Total,	$7,043 92

Bills payable Dec. 1, 1915.

Taxes, town of Hadley,	$148 03
W. N. Potter Sons & Co. to Oct. 1, 1915,	79 40
Judd & Parsons, insurance due in May, 1916,	155 00
Northampton Empire Laundry to Oct. 16, 1915,	44 93
J. A. Ross to Oct. 15, 1915,	271 43
A. McCallum & Co.,	58 45
"Springfield Republican,"	3 90
New England Telephone and Telegraph Company,	5 53
J. A. Ross,	78 74
Total,	$845 41

The amount paid for interest and insurance offsets outstanding bills by $194.16.

Advisability, Practicability and Costs of taking and maintaining.

The State Forester believes that Mount Holyoke, if acquired by the State, will be of much benefit to the people of that section, and once a State property would interest many others throughout the whole State. This mountain has already become renowned for its wonderful scenic beauty, and no one, no matter how much he has traveled, can begin to appreciate its grandeur until he has taken a trip there or, even better, has spent a day or two at the Mountain House.

This mountain is easily accessible by automobile, and has a splendidly constructed road of comparatively easy grade to the top. It is a landmark well worthy of acquisition by the State for a public reservation for all time. The purchasing of this property by the State, however, should not in my estimation be looked upon as a purely forestry undertaking, for while the arboreal cover may be considered as of great importance in connection with the general effect, it cannot be recommended as possessing economic importance in growing forest products alone, as it has more value from the broad æsthetic standpoint. Much may be done, however, in practicing forestry on the lower slopes, where some economic results

ERRATA.

On page 121, line 24, for $40,000 read $50,000; and at bottom of page, for $50,000 read $60,000.

can be relied upon; also the whole property is capable of demonstrating good forestry work which would be valuable as an educational object lesson to our people. The impressiveness of many of the beauty spots visited abroad is greatly enhanced by their close relationship to forestry practices, and here could be made, in our own State, a unique example. The property could, if purchased, become a regular State forest, and be managed under the same regulations as other forests now being acquired.

The value of the property, due to the great amount of expense necessitated by the building of the road to the summit, the mountain hotel on top and other reservation buildings, together with the expense of the incline railroad, is a factor that needs to be considered independently of the forestry question. That the first expense of the property in developing it to its present stage was very great there can be no question. The present owners consist of a number of our public-spirited citizens who became interested more from public concern than from the possibilities of profitable investment, and they are interested with others in seeing the property made a State reservation.

When they purchased the property there did not seem to be sufficient public interest, but it was hoped it might develop. It is believed that the time has arrived when the State can now acquire it.

The owners of the property have made the State the following offer for sale of the property through the State Forester. They ask the sum of $40,000. The whole proposition, it is believed, is well worthy of a favorable consideration by the State. The State Forester has endeavored to make matters clear as to the exact conditions. It is not merely a forestry question. It is a question of preserving for all time to the State a beautiful spot which at comparatively small expense could be made an investment that would grow in value to the State, as it grows in age and tradition.

Cost of Maintenance.

It was demonstrated by the experience of the past season that the running of the hotel for the summer season, besides paying expenses, netted the company a small profit. The present method of running the hotel is that of hiring a responsible proprietor to manage the hotel for the company. Mr. John A. Rowell has been employed during the past two or three years. There seems to be the prevailing opinion that the hotel could be made self-supporting. The entire Mount Holyoke property is looked after by a superintendent who resides on the reservation the year round. Mr. Fred R. Lyman is the company's resident superintendent at the present time, and has been serving in that capacity for many years.

The expense of caring for the roads, forest and farm lands entails a working capital sufficient to handle the property. Should the State purchase the property an extra appropriation of $10,000 would be required, making a total of $50,000.

Conclusion.

Should the State purchase the property it might be made a memorial to Mr. Christopher Clark of Northampton, whose heart and soul were wrapped up in the preservation of this grand mountain. He died on Nov. 21, 1915, at the age of eighty-eight. Mr. Clark had a deep love for nature, particularly for trees and mountains, was a remarkable character in Massachusetts, and was untiring in his efforts to preserve Mount Holyoke. It is believed the property would have been neglected and undeveloped had it not been for his personal public-spirited interest. Many, and probably most, of the present stockholders subscribed through Mr. Clark's personal solicitation, with no idea of remuneration but to further a good cause. The fond hope of Mr. Christopher Clark, as he expressed it to the forester on the mountain last summer, was that he might live to see Mount Holyoke owned by the State. He was perfecting the data for this report at the time of his sudden death.

Respectfully submitted,

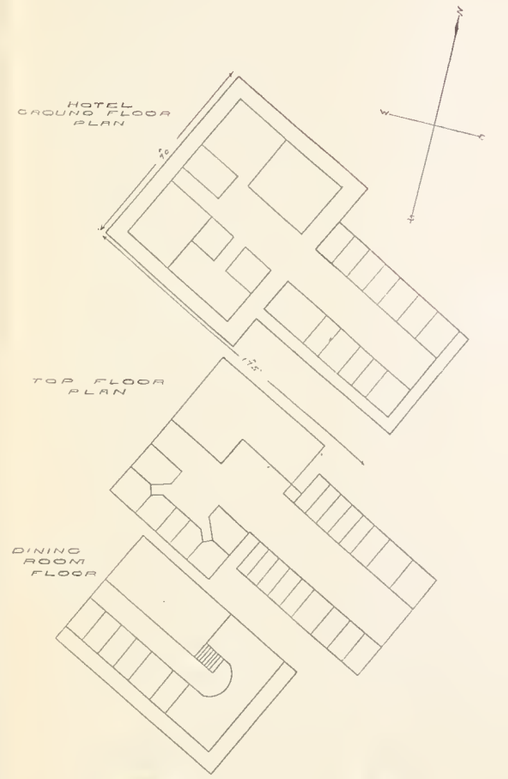
F. W. Rane,
State Forester.

Meetings and Addresses.

The department has been called upon as usual to address various organizations and meetings throughout the year. While it has been impossible to do as much of this kind of work as formerly, due to our other numerous duties, nevertheless we were represented at the following meetings during the year: —

Easton, State Grange, fall meeting.
Danvers, State Grange, fall meeting.
Monson, Agricultural Society.
Easthampton, institute meeting.
Tyngsborough, State Grange field meeting.
Plymouth, Commercial Club.
Blackstone Grange.
American Forestry Association.
Lynn City Government.
Dedham Board of Trade and Business Men's Association.
Ohio State University, Columbus, O.
Cotuit Grange.
Barnstable town meeting.
Athol Grange.
Essex Agricultural School.
Norfolk Neighborly Club.
Pomona No. 1, Holliston.
Society for Protection of New Hampshire Forests, Keene, N. H.
Peterboro, N. H., Improvement Association.
Sturbridge Grange.
State Grange field day, Wrentham.
State Grange field day, Charlton.
Duxbury Garden Club.
North Reading Patrons of Husbandry.
Massachusetts State Firemen's Association.
Public moth meeting, Mayflower Grove.
Overseers of the Poor Association.
Boston Planning Exhibition, "Shade Trees and Forestry."
Massachusetts State Board of Agriculture.
Hampden County Improvement League.
Williams College, Good Government Club.
Massachusetts Agricultural Development Committee.

MT. HOLYOKE RESERVATION



PLAN OF MT. HOLYOKE PROPERTY
SHOWING APPROXIMATE DISTRIBUTION OF GROWTH.
(TO ACCOMPANY REPORT)

STATE FORESTER'S OFFICE
1915

"TYPE" EXPLANATION

- 0-5" DIA., MIXED HARDWOODS, MOSTLY CHESTNUT SPROUTS.
- SMALL AND MEDIUM MIXED HARDWOODS 0-9" DIA.
- 0-20" DIA SMALL, MEDIUM AND LARGE MIXED HARDWOODS & HEMLOCK, CHESTNUT PREDOMINANT.
- SMALL GROWTH OF MIXED HARDWOODS & CONIFERS, SCATTERED & STUNTED.
- PURE STAND WHITE PINE, 8-10" DIA.
- NEARLY PURE HEMLOCK, 6-24" DIA

Committee on White Pine Blister Rust.
State Forest Commission.
Mount Grace citizens' meeting.
Massachusetts Committee of the Unemployed.
Cape Cod Cranberry Growers' Association.
New Bedford Water Works Committee.
Mount Holyoke Company, meeting.

The following address was delivered by the State Forester at Columbus, O., at the dedication of the Ohio State University Forestry Building, Feb. 5, 1915:—

The Evolution of American Forestry.

The part that forestry has played in our development as a nation is a subject well worthy of our consideration on this happy occasion. In dedicating a building to be used for the teaching of forestry at its university, the State of Ohio is simply taking a forward step of fundamental importance. What the forests have meant to this Commonwealth, yea, to our nation, in its development up to the present hour is almost beyond the comprehension of man.

Our forefathers had reason to look upon the forests as a great hindrance. To them they were an obstacle to surmount. It is to the sturdy pioneer, who has with brawn and persistency felled the trees to possess the land for agriculture, the basal industry of the nation, that we must turn to appreciate the real picture of our first period. It was during this period that the log-cabin homes developed a citizenship which gave us the stalwart foundations of our government, and the ideals which we cherish even to this day. The primeval forests in all their grandeur, therefore, were blessings to us as a people in other ways than commercially.

The evolution of the forest in this comparatively new country is interesting. Following the pioneer and his log house came the development of the water-power and the old-time substantial sawmill located upon our streams. During this period every rural community had its grist and sawmill, and about this center the rural town sprang up. The gristmill furnished the flour and the sawmill converted the forest into a commercial commodity. In those days the farmer was the lumberman, for every farm had its woodlot. The average farmer's family was large, and furnished its own labor. During the growing season there was plenty to do in general agriculture, while during the winter this same labor was equally busy harvesting the lumber crop. All hands, together with teams and oxen, were busy getting saw logs off to the mill. Each farmer had his particular pile of logs, and as the sawyer was ready for them he rolled them into the mill, and, as well, went into the pit and drew away his lumber. Saw logs in those days were real saw logs, the larger the diameter the chestier the farmer or his son as he handled them. It was a board of at least a foot in width that was wanted, and such a thing as the commercial New England box board would have been looked upon with contempt. This lumber was taken home and used in the construction of the sub-

stantial farm homes which even now dot the countryside. Again, enough lumber was sold to make one hand wash the other. During this period the farmer was the lumberman. During this period, also, a natural forest policy was being carried out. As only the larger or mature trees were cut, it of course followed that those of medium and smaller size were allowed to remain. These in turn shortly grew to merchantable size, and were harvested in like manner. This method kept the land constantly stocked and yielding forest products.

Following the second period came the innovation of the portable sawmill. Through the development of the portable steam engine it was quickly seen that it was a more economic proposition to take the mill to the logs, rather than the logs to the mill. This proved the death warrant to the water-power mill, which tale is told over and over again throughout the land by the many deserted monuments now crumbling upon our streams.

The portable mill period is still with us. As the country has grown older there has been a tendency towards specialization, and the mill man or lumber operator has so perfected the business that he now controls and manages an industry of large proportions. The lumbermen have rapidly spread over the country, until to-day they represent some of our wealthiest corporations, and are called timber barons. Gradually the lumber centers have spread from the east to New York and Pennsylvania, thence to the pineries of Michigan, Wisconsin and Minnesota, and thence to the Virginias and Carolinas. The primeval growths of every section have been exploited and operated, until to-day finds us procuring from our local lumber yards, redwood shingles and sugar pine from the great Pacific Northwest, cypress from Louisiana, white wood or yellow pine from the central south, and Georgia pine from the States of that section. What this natural resource has meant to us is evidenced by the forest products that have been cut in such States as Mississippi and Alabama, Missouri and New Mexico, New Hampshire and Maine, Colorado and Montana, not to mention the great lumber-producing States of the Pacific coast.

The nation could not have developed to its present state of efficiency without our indigenous forest products, for the uses to which they are put are legion. Of what else could we have built our homes or cities and villages, bridges and railroads, constructed our telegraph and telephone lines, propped our mines, traversed the seas, and, in fact, made our implements, vehicles, etc.? Even the by-products, as tar, pitch, turpentine, charcoal, resin, alcohol, tannin, etc., are again important industries, and are essential to our great economic success.

Wood as fuel played a great factor in earlier days, and even now is of importance in many sections. As coal and oil fields become exhausted we may yet return to wood as the most natural and economic fuel.

So I might go on almost indefinitely, but perhaps this is enough to demonstrate the real importance of the forest in our present development. The portable steam and, later, electric sawmills have had their mighty

sway throughout the land, and this stage of our development has outrivaled all others.

This rapid development has been shown not only in the utilization of our forests, but to a greater or less extent in the utilization of the other *natural resources* which constituted our birthright. In our wild rush of development and utilization we have disregarded the future, and lived only in the present, until now we must pause to realize that this kind of development is effective for a time, but extremely wasteful in the end. "Conservation," a term which expresses in one word caution and economy, has of late been the slogan of our constructive and thoughtful people. This campaign first originated in forestry, but was quickly applied to the conservation of all our natural resources. We have reached that stage in our national development when we must of necessity not only employ rational and sane principles of conservation, but must take a further step in the restoration of our inexhaustible resources, like forests. Waste, mismanagement and forest fires have destroyed enough of forest resources alone to have supplied our wants for many years to come, not taking into account the effect upon stream flow, the denudation of the soil and other correlated calamities.

But why should we concern ourselves with the water that has flowed over the dam! It is the future in which we are now interested, and as we meet here to dedicate this building to forestry we feel confident that the great State of Ohio fully recognizes the importance of what forestry may be to Ohio's future, —nay, must be, provided she realizes her greatest success.

Now that Ohio has erected this building to forestry development and instruction, it will naturally follow that from this, as a center, much of a constructive and practical value will be disseminated. A knowledge of tree life, either from the economic or æsthetic standpoint, appeals to the average citizen, and an opportunity to study forestry during the formative stages of student life should be at his command. It is a mistaken idea, but one we are prone to accept, that a study of forestry is of use simply to the would-be forester, lumberman or farmer, while really a knowledge of trees and forests will give a touch of pleasure and inspiration to the traveler, writer, sportsman, poet, artist, or even literary genius, that no other subject can replace. In these days of specialization we need a blending of knowledge on the part of our students that we may still retain standards of real culture. I therefore recommend courses in fundamental forestry, at least, to all university and college students.

One of the greatest pleasures on the part of our American tourists when visiting Europe in recent years has been the trip to the renowned Black Forest country of Germany. Many of these same people, who have had little interest in our own woods, other than to deplete them, find here a kindly respect and reverence for trees and forests. Where can one get greater delight than tramping through this unique country? These splendid forests not only are beautiful, but they are handled so dexterously

that they solve the great economic problem of supplying forest products, and give constant employment to an army of men. In turn, the municipal forests are to many of the smaller towns and cities what large areas like the Black Forest are to the nation. Here again we do well to study and emulate their example in Ohio and elsewhere. These forests play a very important part in not only paying a large part of local taxes, and furnishing work for the inhabitants, but they really constitute the playgrounds of the nation.

In the past we Americans have felt our duty accomplished when we have established parks and public squares in the center of our villages and cities. These are all right so far as they go, but they cannot be compared to larger areas where our people, young and old, could love and enjoy nature on a more pretentious scale. It is time that our educators in schools and colleges get a clear vision of the benefits to come from the outdoor life. The forest, with its abundance of wild bird and animal life, flowers, shrubs, etc., offers a great field for developing a happy and contented people.

High ideals in forestry development, combined with careful methods of education, form the only real solution of the forestry question.

It is no longer a question of simply harvesting the crop, but one of growing a crop that we may have one to harvest. It is going to take time for our men of affairs, who have been busy operators of lumber, to accept the larger and broader viewpoint, and regulative legislation, both national and State, must be called in now and then to ameliorate conditions.

Already much has been accomplished. We have a national forest service which has done much in recent years to interest our people in the subject. Many of our States have a forester or commissioner who is clothed with the responsibility of formulating a State forest policy. In this work, as in all others, it is extremely important that they should cherish the fact that they are molding the foundations of great future possibilities in forestry, provided the work is laid out on a broad and comprehensive plan. While forestry is new with us, it nevertheless has been practiced in Europe for centuries, and the great good to come to any State that encourages its practice is evident to all who are competent students of the subject.

We Americans are slow to act, but once we have satisfied ourselves that we are on the right path nothing daunts us. In this connection may I venture to say that now that Ohio has a splendid new building, where the department of forestry is happily housed, the next step that should follow is that of creating the position of State Forester. Surely the great State of Ohio, with its gigantic manufacturing, agricultural and mining industries, can find a perpetual use for all the forest products that she can grow, and local production brings about conditions for an economic success that otherwise would be impossible. Ohio should have a well-defined State forest policy. It is just as important that our depleted and worn-out lands, that originally should never have been cleared for agriculture, be returned to forests, as it is that we practice better farming upon the lands

now under cultivation. While I am not sufficiently familiar with this State to point to specific examples, nevertheless I dare say there are thousands upon thousands of acres of land that are too rocky, mountainous, sandy, moist, hilly, stony, etc., to be of value to anybody. These same lands, however, were originally covered with a heavy growth of timber, and they should be returned to that condition. To accomplish this task will need direction and a due sense of responsibility on the part of a State forester. Ohio is a natural forest country, and it is none too early for the State to establish demonstrative State forests on just such lands. It is unreasonable to expect private capital to undertake this work until it is shown that the investment is practical. Also the great danger from forest fires must be eliminated by instigating State-wide systems of patrol and management. Forest fires should be as systematically and effectively combated in the country as our city fires are. There is little use of advocating reforestation without first giving sufficient fire protection. Much has been done in some States in the way of installing lookout stations and forest-fire fighting equipment. Massachusetts has 26 lookout stations and 353 forest wardens, besides 1,800 deputy forest wardens, as her fire-fighting organization. The Massachusetts forest warden, who is an official appointed by the selectmen in towns and the city government in cities, subject to the approval of the State Forester, is clothed with the following powers and duties: —

No warrants can be paid for fighting forest fires without his approval. He may compel any citizen between the ages of eighteen and fifty-one to assist in fighting forest fires, or may impress teams and implements. No fires may be set out of doors from March to December without a permit from him. He appoints his own deputies, has the power to arrest without a warrant persons caught setting fires, and is responsible for the disposal of brush and slash. He also is of assistance to assessors in securing data for forest taxation. These are some of the more important of his duties.

A State forest policy should embrace and regulate the following subjects: —

Expert services should be given without expense, except for travel and subsistence, to anybody in the State, particularly emphasizing forest planting on the part of the farmers. Forestry literature of a practical nature should be disseminated whenever there is a call for it, the most economic utilization of all forest products should be carefully studied, and a modern system of taxation should be adopted in every State. A nursery would prove of great assistance in planting State lands, while in many States small trees might be sold at cost. The poorer towns should be given State aid in the purchase of forest-fire fighting equipment. Five hundred dollars will make a very good beginning. Each State needs to regulate the disposal of its brush and slash, since some of the worst fires get their momentum from its being allowed to remain. Also, all railroad engines burning wood, coke or coal should be inspected, to see that they are properly protected with spark arresters, ash pans and grates.

Other regulations worthy of mention are as follows: —

The Governor should have the power to proclaim the hunting season closed during a very dry time. Fish and game deputies should have the same authority as regards forest fires as the forest wardens. The boy scouts should be utilized as fire fighters, and the rural mail-carriers be compelled to report all forest fires to the forest warden or his deputies.

In conclusion I wish to touch upon one other subject, and that is the outlook in the future for a well-equipped forestry student. This is a subject about which all foresters are being asked. Forestry has come into importance rapidly of late, and forest schools have quickly sprung into existence. When the writer was a student in this university, 1888 to 1891, there were no forestry schools in the country, and all have been of comparatively recent origin. The men who are in the more important forestry positions to-day received their education through personal love and devotion to the subject, and they were their own instructors. The forestry schools and departments in our universities and colleges are awakening a real interest, and training young men in a profession which is bound to grow in importance and value. Not all young men who choose the profession necessarily will make a success in it, but I can see no reason why there are not many openings for those who really love the outdoor associations and rugged life of the forester. We certainly are going to need an army of well-trained and efficient men to construct and carry on the work already begun in some of our States, and to organize and develop forest policies in a large number of States where at present little, if anything, has been attempted. I have little patience with the man who is constantly foreseeing every profession filled up and no chance for the future. If a young man has the right kind of stuff in him, and forestry appeals to him, I predict he may find a field here wherein he can not only earn a livelihood, but he can be of great service to his State and nation also.

With this new building, and with the inspiration that its classrooms, laboratories and library will afford, coupled with the wholesome environment that will ever prevail so long as our own Professor Lazenby and his policies persist, I am sure forestry at the Ohio State University will ever be taught and dispensed to Ohio's sons and daughters with delightful satisfaction.

I congratulate the university and the great State of Ohio in its splendid forestry endeavor, and wish even greater things for you in the future.

New Legislation.

No legislation of particular importance relating to the work of this department was passed at the last session of the General Court. The law relative to the sale of arsenate of lead was amended so as to read as follows: —

Chapter 80, General Acts of 1915.

An Act to authorize local moth superintendents to furnish arsenate of lead to towns.

Be it enacted, etc., as follows:

Section 1. Section one of chapter six hundred and five of the acts of the year nineteen hundred and thirteen is hereby amended by striking out the words "now receiving aid from the commonwealth in suppressing the said insect pests", in the third and fourth lines, — so as to read as follows: — *Section 1.* For the purpose of assisting in the extermination of gypsy and brown tail moths, the local moth superintendent in any city or town is hereby authorized to furnish, at the cost thereof, arsenate of lead to any owner of real estate situated within the limits of such city or town. Material purchased under the provisions hereof shall be used only for the suppression of gypsy and brown tail moths and only upon land of the purchaser.

Section 2. This act shall take effect upon its passage. [*Approved March 18, 1915.*

The law requiring the mayor of cities and the selectmen of towns to send notices to owners of property infested with gypsy and brown-tail moths was amended, giving to said officials the authority to publish the notice in newspapers published or circulated in the city or town at least three times during the month of October if in the opinion of the mayor or selectmen such publication will be a sufficient notice.

Recommendations.

1. As the gypsy-moth conditions menacing the cranberry bogs in southeastern Massachusetts have become very grave, the work of the suppression of this insect in that district calls for due consideration and sufficient funds to cope with the situation.

2. The law requiring permits to set fires in the open air should be so amended as to apply to all cities and towns in the Commonwealth.

3. It should be the duty of every city and town to provide itself with the proper facilities for housing its forest fire and moth equipment in some suitable place.

4. It is believed that our forest-fire work can be greatly strengthened and made more effective, provided we establish in each

State forest-fire division, of which there are four, an auto truck equipped with fire apparatus, to be used as an auxiliary in such towns as find they need extra assistance. This equipment is just the aid needed many times to control a fire situation, and, being State property, would be in touch with the lookout observers and division wardens, and manned by the State Fire Warden's men during the dangerous fire seasons. As there is an unexpended balance each year of the appropriation made available to reimburse towns for forest-fire fighting equipment, it is recommended that legislation be enacted authorizing the State Forester to apply this unexpended balance to the purchase of the equipment outlined above.

5. The white pine blister rust, one of the diseases of the white pine, should be given due consideration at the hands of our various State officials, particularly the pathologist of the Agricultural Experiment Station and the State Nursery Inspector, in determining our conditions as regards this disease. Some definite policy of holding the disease in check, or exterminating it if possible, should be arrived at. It is believed that while this disease may become very destructive to our white pines, nevertheless the danger is not sufficient to discourage prospective planters of the white pine. It is not our purpose to minimize the importance of this disease, nor do we intend to lessen our endeavor to combat it. We do, however, believe it a good policy not to overexaggerate the question, and thus necessarily deter the constructive work of reforestation, until there is more convincing proof than is to be had at present that the disease is likely to become a great menace to white pine. It is to be hoped that the average Massachusetts citizen will go ahead planting white pine as enthusiastically as ever, leaving the problem of its protection from diseases and insects to be looked after by technically trained officials.

F. W. RANE,
State Forester.